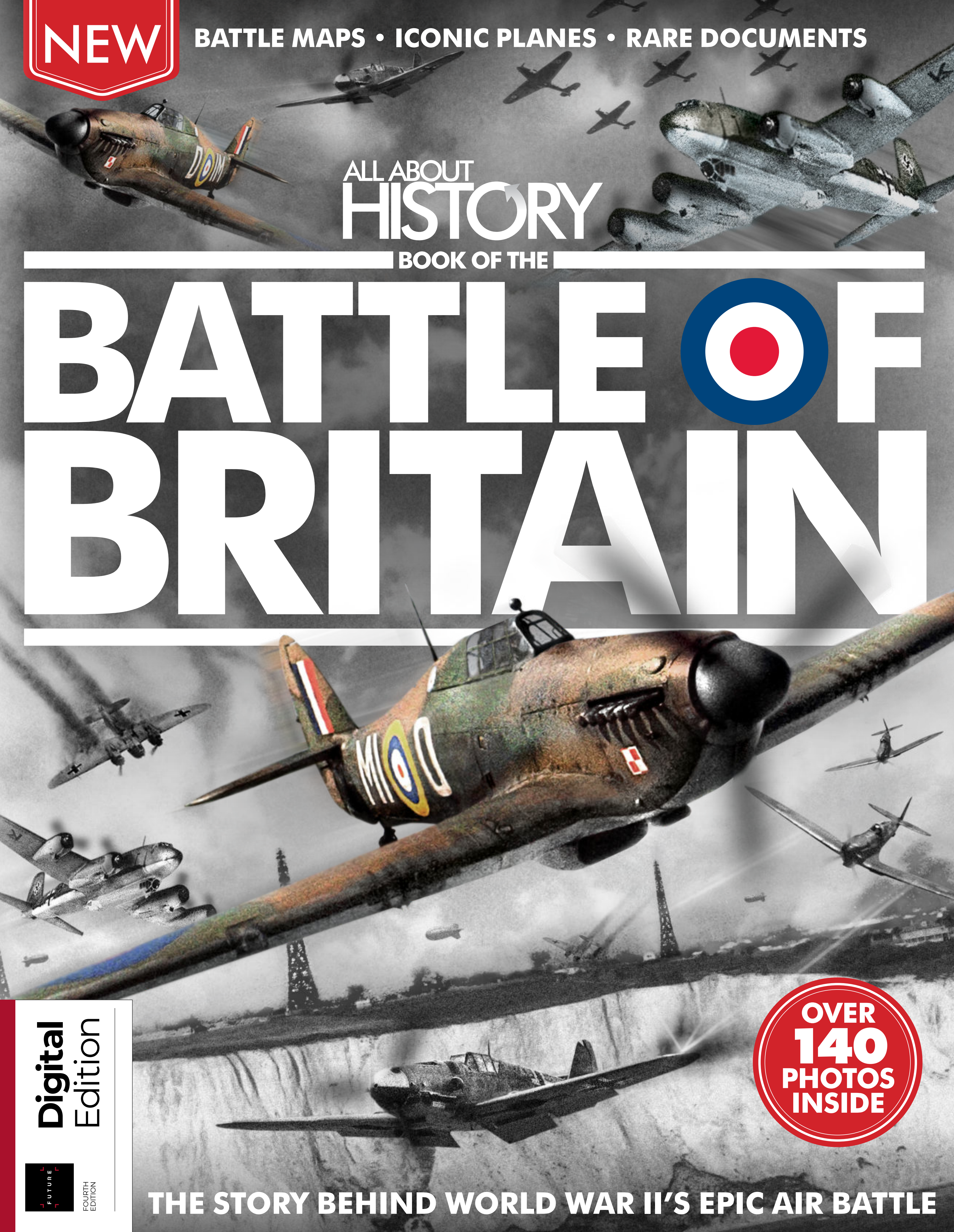

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ALL ABOUT HISTORY
BOOK OF THE

BATTLE OF BRITAIN

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All About History Book Of The Battle of Britain Fourth Edition

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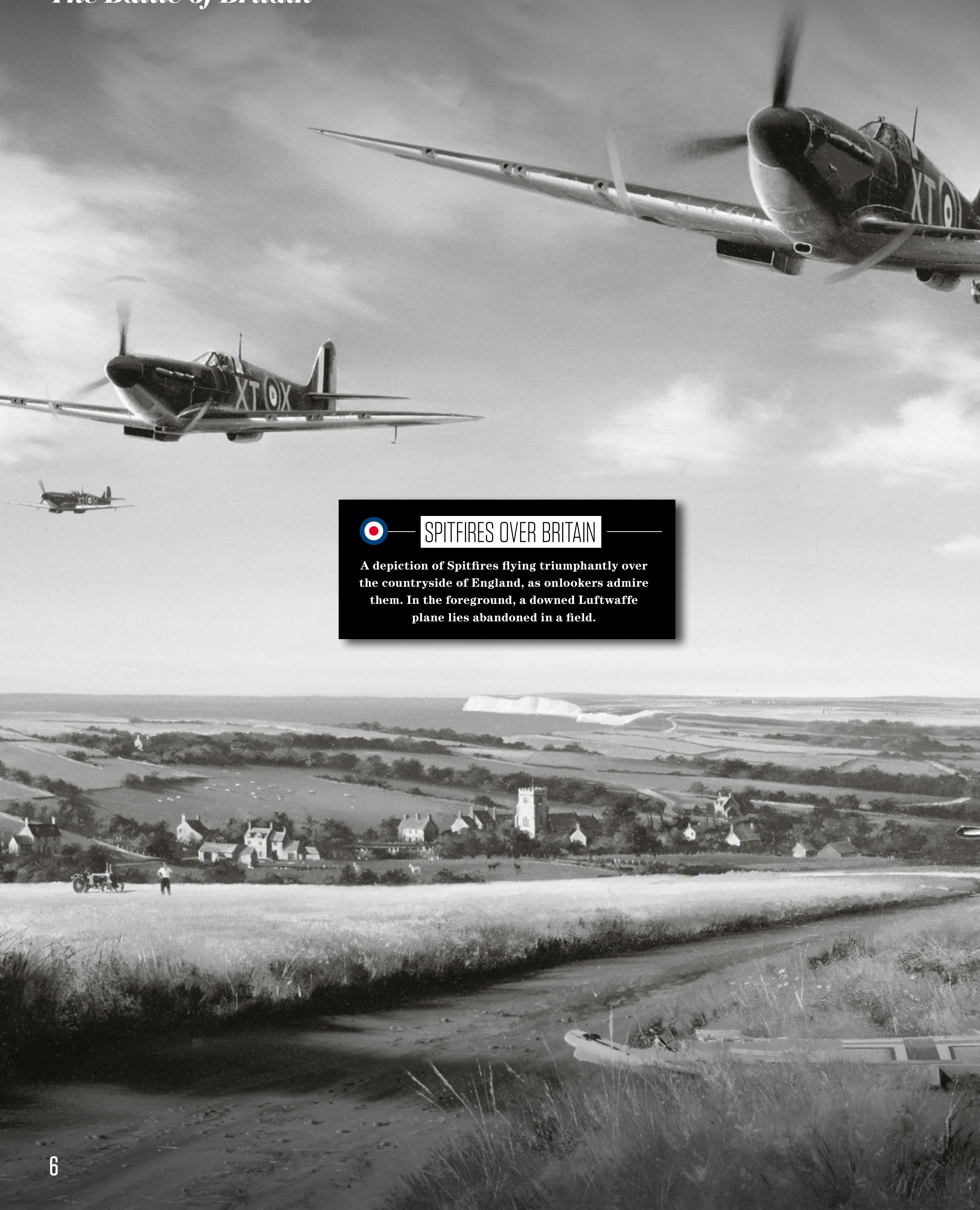
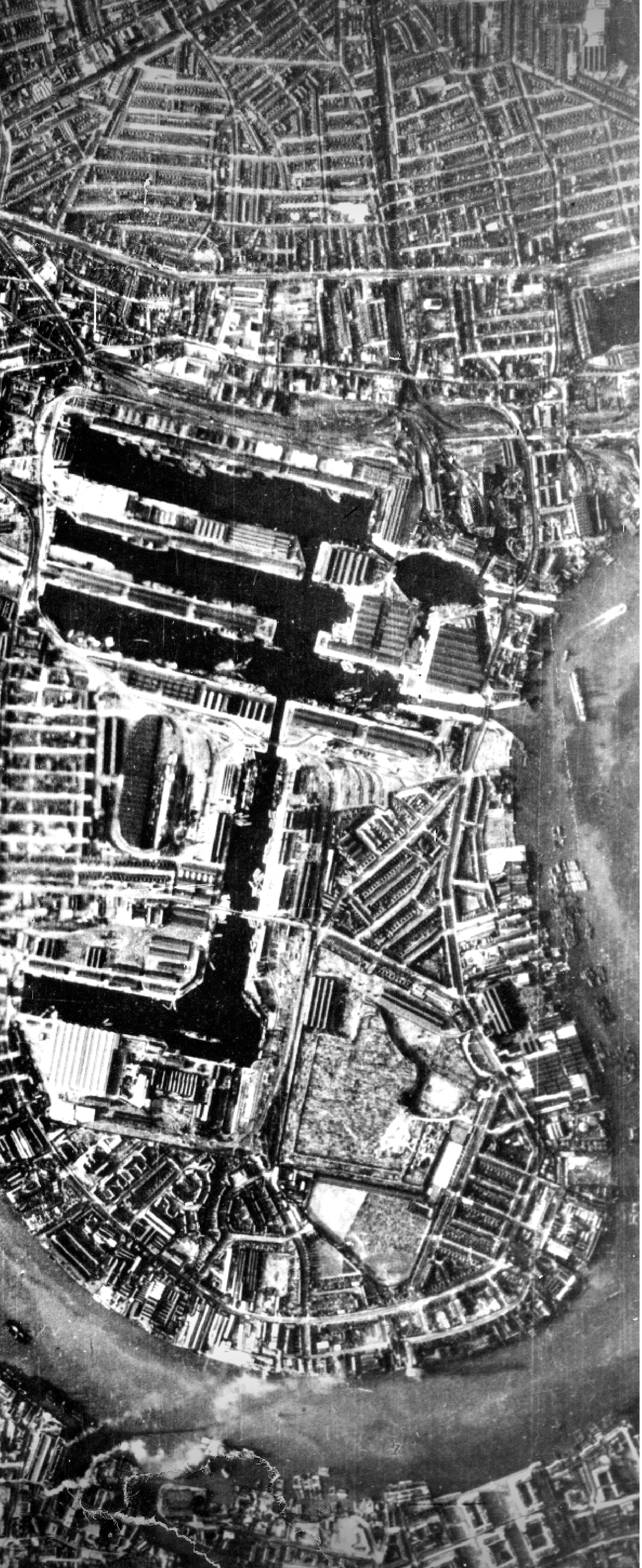


SPITFIRES OVER BRITAIN

A depiction of Spitfires flying triumphantly over the countryside of England, as onlookers admire them. In the foreground, a downed Luftwaffe plane lies abandoned in a field.



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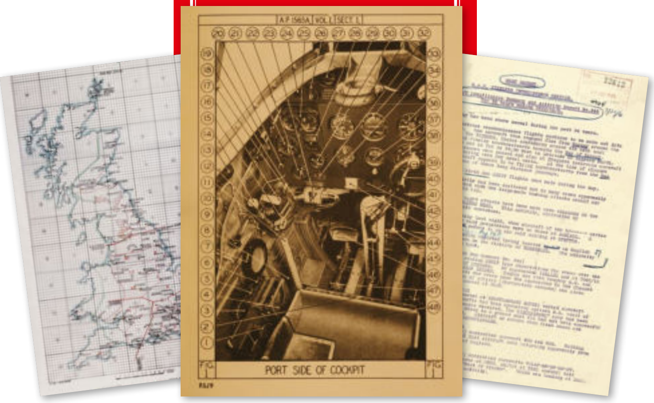

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UFOP
UFOW
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HAWKER HURRICANES

A group of Hawker Hurricanes fly in formation over southern England. The Hurricane was the first operational RAF aircraft that was capable of flying at a top speed in excess of 300mph.

59
Y
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56

FORGOTTEN HEROES

75 years ago, Hitler was on the verge of becoming master of all of Europe. Only the Royal Air Force stood in his way

On 18 June 1940, Winston Churchill stood up in Parliament. The mood was gloomy. France had just surrendered, most of Europe was now under Nazi control and Britain faced Germany alone. "The Battle of France is over," he announced. "The Battle of Britain is about to begin. Hitler knows he must break us in these islands or lose the war. If we can stand up to him, all Europe may be freed. But if we fail, then the whole world will sink into the abyss of a new dark age."

Churchill had been warning of war for years but few had listened. The Nazis had spent much of the 1930s building the modern war machine that had just ravaged most of Europe. By contrast, British rearmament had only begun in earnest just six months before the conflict began. What little preparations had been made, however, would prove to be enough. But only just.

Hitler's planned seaborne invasion of the British Isles, codenamed Operation Sea Lion, was risky. To succeed, the German Luftwaffe needed to first gain complete air superiority. Although the campaign began on 10 July, the true purpose of it wouldn't become apparent until Hitler's so-called Eagle Day on 13 August. Between those two dates, skirmishes over the Channel, as the Luftwaffe picked off British shipping convoys, disguised the fact that on the mainland two huge air fleets were being assembled at newly captured airfields.

By the time Eagle Day arrived, the Germans had amassed about 2,500 aircraft with the aim of annihilating the RAF and its 660 serviceable fighters. All that now stood between Hitler and his new dark age were the courageous souls who would take on that monstrous armada. Most of them were barely out of their teens, and history would come to remember them as 'The Few'.

LEFT: Finucane's heroism soon spread beyond RAF ranks. Models of his Spitfire with its distinctive Irish shamrock nose art were even sold in toy shops.

BRENDAN FINUCANE

NATIONALITY: IRISH
RANK: FLYING OFFICER, 65 SQUADRON

He'd go on to become a poster boy for the RAF, but the career of this legendary fighter pilot almost didn't get off the ground

01

12 August 1940, the day before Eagle Day, witnessed the first major bombing of an RAF airfield as Luftwaffe units probed inland, testing Fighter Command's resolve before the battle ahead. That day, RAF Manston in Kent was playing host to 65 Squadron, and among its ranks was Brendan Finucane. The son of an IRA man, Finucane would go on to become one of Fighter Command's greatest aces, but the 19-year-old was lucky to survive the Luftwaffe's opening gambit.

With news that a significant force was headed their way, 65 Squadron's pilots scrambled. Finucane and his pals sprinted to their Spitfires and clambered into their cockpits. As they were preparing for take off, however, dozens of German fighters and bombers appeared overhead. Hangers, workshops and vehicles began exploding all around them. As Finucane raced to get off the ground, craters began appearing in the runway before him.

Miraculously, however, he got airborne, as did all but one of his comrades. Within minutes they were hurtling through the skies, chasing the Germans back across the Channel. By the time Finucane landed, he'd shot down the first of what would be many enemy aircraft. When the swashbuckling Dubliner was killed in action two years later, he'd added a further 27 kills. In those dark days, Britain was desperate for heroes, and Finucane's bravery had made him famous. Over 3,000 grateful Britons attended his funeral mass.

ABOVE: After recovering from his wounds, Nicolson returned to active service. In 1945, a plane he was in crashed off the Indian coast. His body was never found.

JAMES BRINDLEY NICOLSON

NATIONALITY: ENGLISH
RANK: FLIGHT LIEUTENANT, 249 SQUADRON

Fighter Command's sole recipient of the Victoria Cross, not just of the Battle of Britain, but of the whole of World War II

02

Despite the extraordinary heroism of The Few, just one of their ranks received Britain's highest military honour, the Victoria Cross. When you're fighting alone high above the clouds, finding witnesses to corroborate individual acts of valour can be tough. In James Nicolson's case, however, his heroics happened low enough to be seen by astonished observers on the ground.

By 16 August, the German raids were relentless. British losses were mounting and things were getting desperate. Around noon a wave of German planes descended on Southampton. Hurricanes from 249 Squadron were scrambled to intercept them. Among the pilots was 23-year-old Nicolson. Moments into the fray he was jumped by German fighters. Shells smashed into his plane, hitting his left eye and foot. The petrol tank was also hit. Fuel poured into the cockpit where it was ignited by the engine. With his cockpit ablaze, Nicolson slid back to bail out, but at that moment an enemy bomber swung in front of him. Despite his plane fast becoming a fireball, Nicolson climbed back into his seat. With only one good eye, up to his waist in flames and his hands blistering on the controls, he closed in on the German plane. Only when he'd destroyed it did the badly burned Londoner bail out, landing unconscious outside Southampton.

GEOFFREY WELLUM

NATIONALITY: ENGLISH
RANK: PILOT OFFICER, 92 SQUADRON

He was just 18 when the Battle of Britain started, and officially the RAF's youngest fighter pilot

03

Geoffrey Wellum's first sorties as a Spitfire pilot had come in May 1940, covering the evacuation of the British army from Dunkirk. He then flew several sorties a day from his base at Biggin Hill, Kent, during the opening part of the Battle of Britain, protecting shipping in the Channel. Nothing, however, could prepare the teenager for what he was to witness on 13 August 1940, when the Luftwaffe sent 1,500 aircraft to destroy RAF bases.

In his 2009 memoir First Light, Wellum vividly recalls the spectacle he encountered. "Within seconds we're among them," he wrote, "each man for himself, fighting his own private battle. Things move terribly quickly. There seem to be hundreds of aeroplanes with everybody shooting at everybody else. I am taken by surprise by the sheer size of this battle in this tremendous arena. Wherever I look the sky is full of aircraft.

"I clamber for height and I have an uninterrupted view. It's magnificent yet appalling. Junker and Heinkel bombers split up, their formations largely decimated, as they head back towards the coast. A Junkers goes down well and truly on fire.

"Yet another plummets to the ground. Three of the crew bail out and only one chute opens, the other two Roman candle. I can see the man at the end of one quite clearly, arms and legs thrashing as he plunges earthwards.

"A Spitfire spins down and a Hurricane dives away, a long trail of black smoke behind it and, at its base, a bright angry red flame. I am transfixed. I don't see anyone bail out. Yet another aircraft goes down in a steep dive. A large one, looks like a Heinkel. My God he's shifting for a big plane and, oh goodness, streaming out behind is a man on the end of a parachute, caught up round the tail and flailing about like the tail of a kite. He may be a Hun, but I wouldn't wish a death like that on anyone."

BELOW: Decorated for heroism, the huge psychological strain of aerial warfare eventually told on Wellum (back row, right). He was withdrawn from combat operations in 1943.

ELSPETH HENDERSON

NATIONALITY: SCOTTISH
RANK: CORPORAL, WOMEN'S AUXILIARY AIR FORCE (WAAF)

The wee young woman from Edinburgh who proved she was as brave as any man

04

Without women like Elspeth Henderson and the Dowding System that she helped operate, Fighter Command would have soon succumbed to the mighty Luftwaffe.

Named after Air Chief Marshall Hugh Dowding, the system was the world's first ground-controlled interception network. It linked observation posts and newly developed radar stations via phone lines to airfields and anti-aircraft batteries. Its ability to forewarn of attacks meant already overstretched squadrons didn't need to constantly patrol the skies but could instead be scrambled in a heartbeat. Its role was to prove pivotal and people like 27-year-old Henderson soon found themselves on the front line.

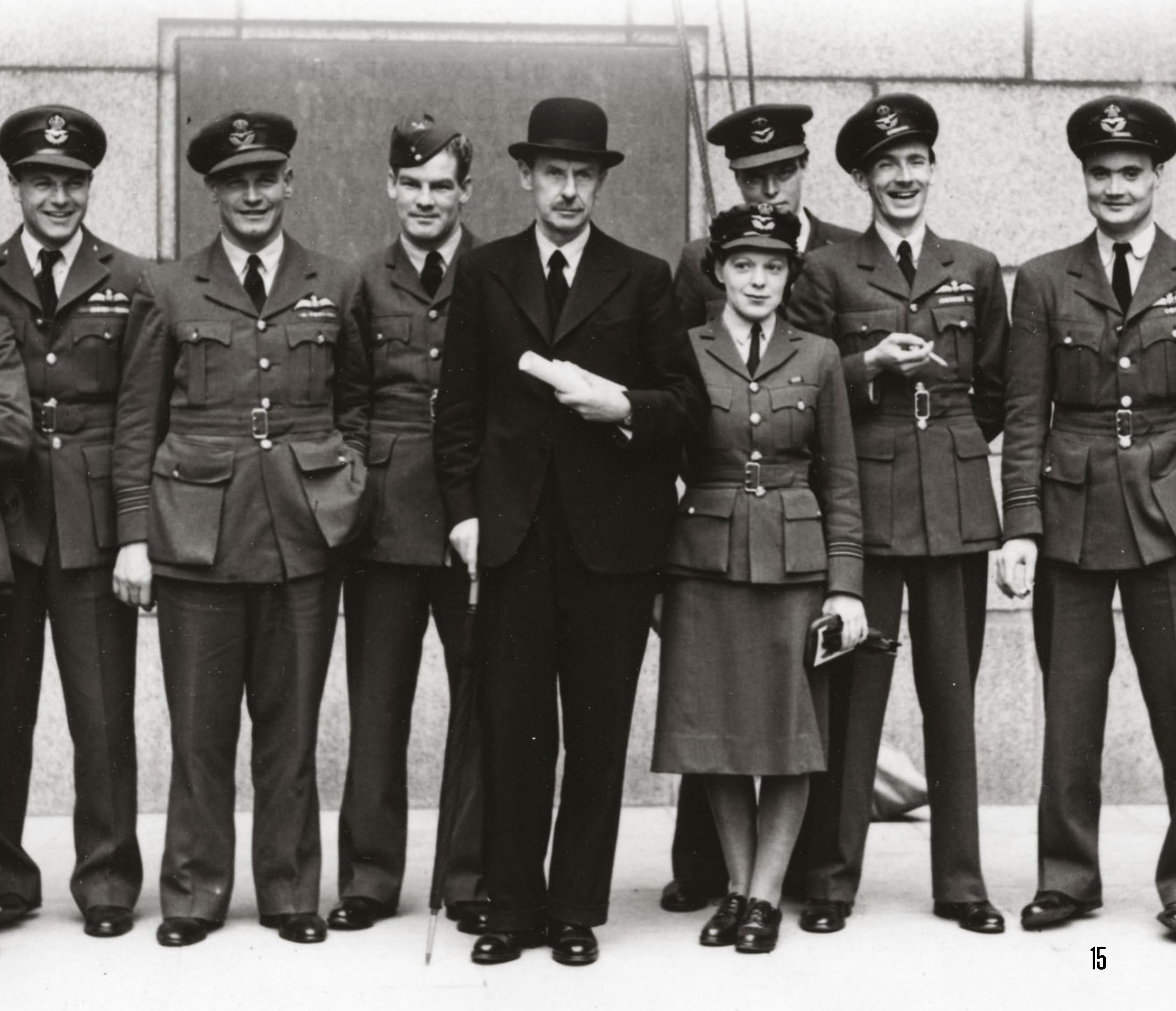
Towards the end of August, RAF Biggin Hill, where Henderson was stationed, was under daily attack. On 30 August, one raid hit a shelter there killing 39 and entombing many others. Henderson was among the first to start digging them out.

The following day, as she was managing the phones in the operations room, the bombers returned. This time they scored a direct hit on the building that she was in. It was engulfed in flames, and the survivors were ordered to evacuate immediately.

Henderson, however, remained at her post and continued to pass on vital information to those who required it. Only when the smoke became overwhelming did the young Scot go about her escape via a shattered window as bombs exploded all around her.

Just six women in the Women's Auxiliary Air Force won the Military Medal during the war. Henderson was one of them. Her citation noted that she'd been awarded it for displaying "courage of an exemplary order."

BELOW: Henderson with Air Chief Marshall Dowding. Houses now stand where RAF Biggin Hill once did, and Henderson has a road there named after her.



ABOVE: After the campaign, Sergeant Lacey was promoted to Pilot Officer. He ended the war with a final tally of 28 confirmed kills, and four probable kills.

JAMES LACEY

NATIONALITY: ENGLISH
RANK: FLIGHT SERGEANT, 501 SQUADRON

This farm worker's son from Yorkshire took huge risks to bag 18 kills and become the highest-scoring lower-rank pilot of the Battle of Britain

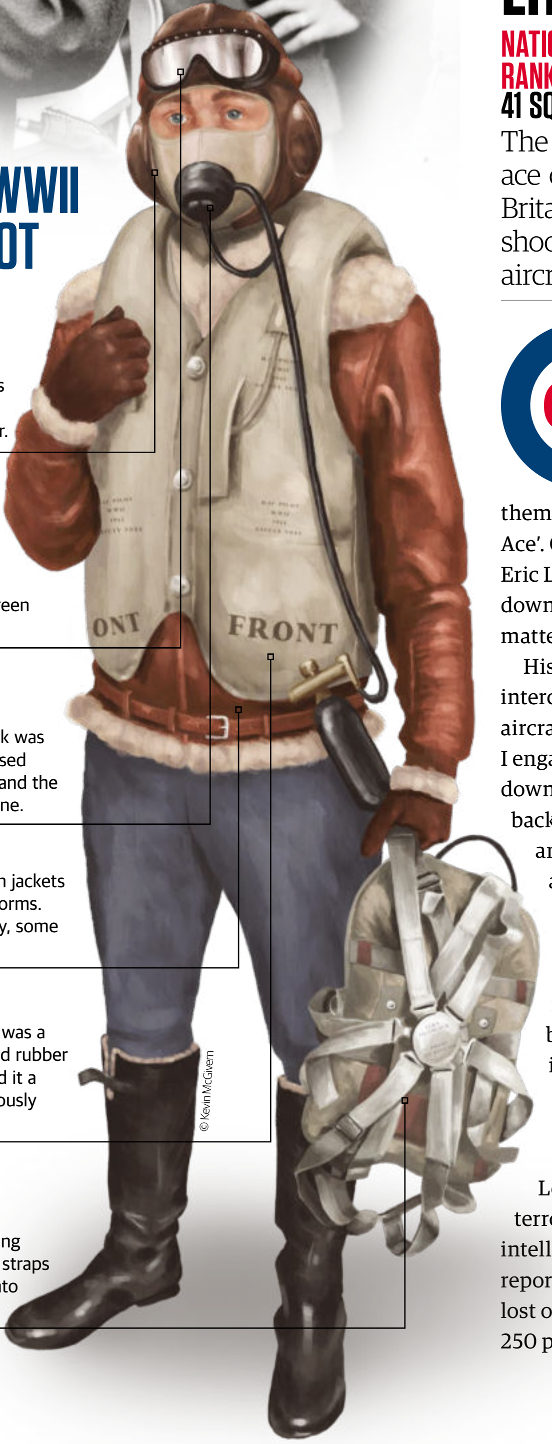
05

By 30 August 23-year-old James Lacey was heading back to the coast after a dogfight that had left his plane riddled with 87 bullet holes. His engine gave out, but Lacey was determined to get his Hurricane home.

Figuring that he had just enough altitude, he decided to glide back to land – roughly 15 miles. Not only did Lacey reach land, but he also managed to put his plane down perfectly on the runway at RAF Gravesend.

"I was lucky," Lacey later recalled. "I was shot down nine times in the 16 weeks the Battle of Britain lasted… Waiting to go up terrified me. Waiting for that Tannoy to say 'scramble!'. It could make me physically sick. I didn't have butterflies in my stomach back then, I had vultures."

ANATOMY OF A WWII RAF FIGHTER PILOT



© Kevin McGivern

TYPE B FLYING HELMET

Made from leather, lined with chamois and with a layer of cotton padding between, each helmet was customised by the airbase tailor so that the earpieces fitted the wearer.

MK II FLYING GOGGLES

The brass frames were usually blackened and the backs of them trimmed around the edges with faux-fur for extra comfort. The laminated lenses also had a blue-green tint to deal with sunshine.

OXYGEN MASK AND MICROPHONE

The wool and chamois oxygen mask was fitted to the helmet. The front housed both the inlet for the oxygen tube and the attachment point for the microphone.

IRVIN JACKET

With no in-plane heating, sheepskin jackets were worn over the top of the uniforms. As the collars could restrict visibility, some pilots would cut them off.

LIFE VEST

Being shot down over the Channel was a real risk, so pilots wore a cotton and rubber inflatable life vest. Pilots nicknamed it a 'Mae West' in honour of the notoriously buxom Hollywood star of the day.

C-2 PARACHUTE

Pilots would grab their parachutes and strap them on shortly after being scrambled. Shoulder, waist and leg straps met at a single point and clipped into a quick-release clasp on the chest.

BELOW: Lock shot down 26 enemy aircraft during the campaign.

ERIC LOCK

NATIONALITY: ENGLISH
RANK: PILOT OFFICER, 41 SQUADRON

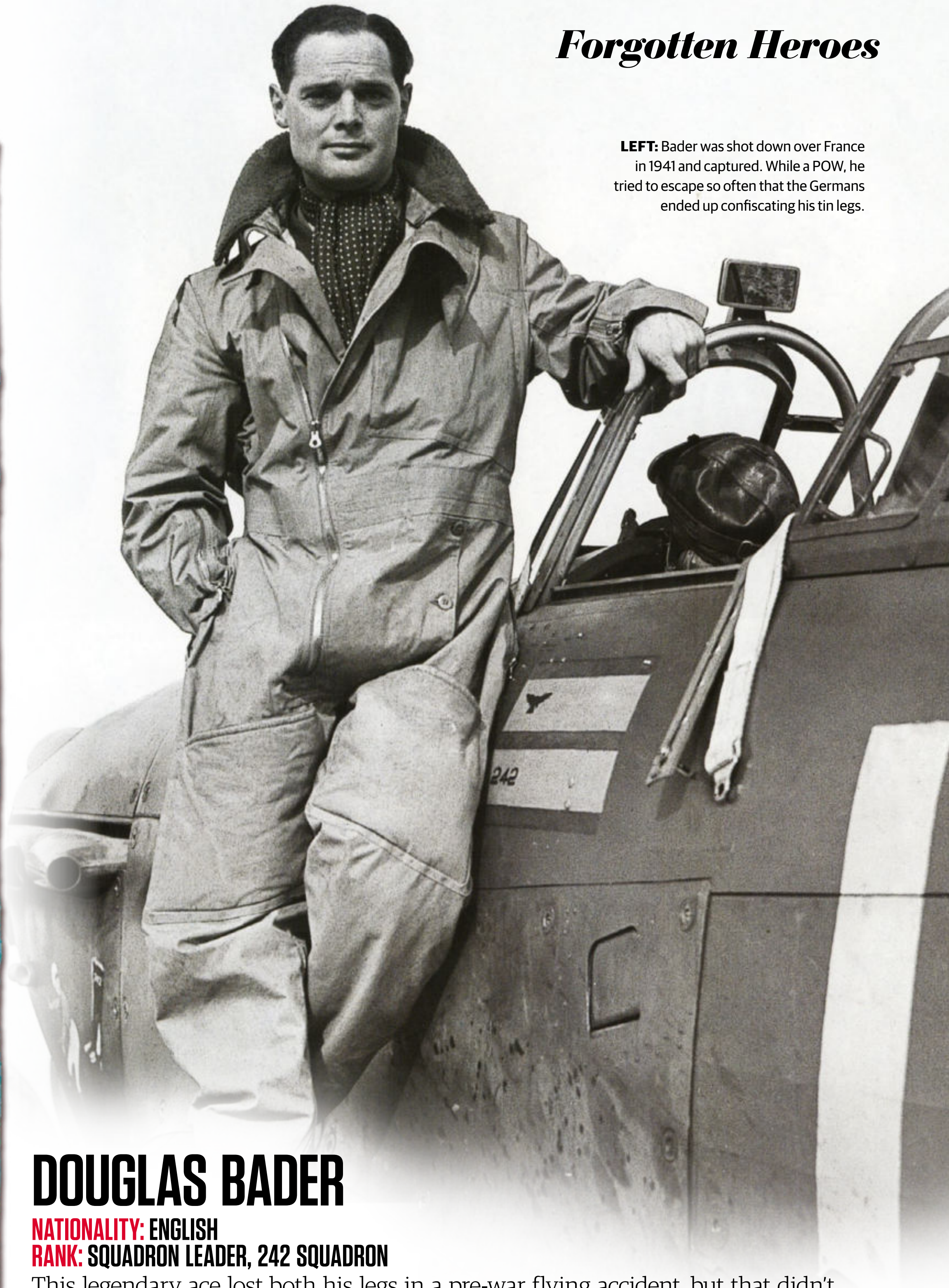
The highest-scoring RAF ace of the entire Battle of Britain, who managed to shoot down three enemy aircraft in one brief sortie

06

By the start of September, many pilots had already notched up more than five kills, giving them the coveted title of 'Fighter Ace'. On 5 September, 21-year-old Eric Lock joined them by shooting down three enemy planes in a matter of minutes.

His combat report reads: "We intercepted a formation of enemy aircraft, attacking the bombers first I engaged a He111, which I followed down until it crashed. I climbed back up to 8,000 feet, saw another He111, engaged that and set his starboard engine on fire. I closed in to about 75 yards and fired two long bursts. Smoke came from the fuselage. I was then attacked by a Me109 who wounded me in the leg. As he banked away, he stall-turned. I fired at him. He exploded in mid-air."

The understated tone of Lock's report belies the true terror. By the time his squadron intelligence officer had typed this report up, Fighter Command had lost over 500 planes while nearly 250 pilots had lost their lives.



LEFT: Bader was shot down over France in 1941 and captured. While a POW, he tried to escape so often that the Germans ended up confiscating his tin legs.

DOUGLAS BADER

NATIONALITY: ENGLISH
RANK: SQUADRON LEADER, 242 SQUADRON

This legendary ace lost both his legs in a pre-war flying accident, but that didn't stop him help turn the battle in Britain's favour

07

At the age of 30, Douglas Bader was older than most RAF pilots and his leadership was to prove inspirational to the younger men. On 15 September, the Luftwaffe launched its largest attack in the belief that Fighter Command was so stretched it could destroy its remaining aircraft.

With the fighter squadrons attacking in 'big wing' formations of up to 60 planes – a tactic Bader endorsed – the RAF inflicted colossal damage on the Luftwaffe at little cost to themselves. For Bader it would prove a particularly successful day.

Just after noon, his wing ran into a great mass of aircraft, both British and German, outside of London. In fact, the skies were so busy that, according to the report he later gave an intelligence officer, his wing "had to wait until Spitfires and Hurricanes engaging the enemy broke away." Once they had, Bader sent his Spitfire force to attack the German fighters, while he and his Hurricane pilots got stuck into the bombers.

His report reveals: "[Bader] opened fire at 100 yards in a steep dive, and saw large flash behind the starboard motor of the Do17 as its wing caught fire… As all the bombers were destroyed S/Ldr Bader's comments are worthy of repetition. 'It was the finest shambles I've been in. For once we had position, height, and numbers'." 15 September proved to be the tipping point of the campaign.

A DAY IN THE LIFE OF A BATTLE OF BRITAIN PILOT

From dawn until dusk every day for 16 weeks, Fighter Command's pilots had to be ready to meet the Nazi threat in the skies

04.00HRS WOKEN AT DAWN

All fighter pilots' days started at dawn with a cup of tea brought to them by a junior rank. They wash and dress before being driven in lorries to the dispersal area. Here, by the runway, they eat breakfast – if they have the time – and wait.

10.00HRS "SCRAMBLE!"

By mid-morning, the radar stations start picking up incoming enemy aircraft. The dispersal area phone rings. The duty officer answers, nods his head, then clicks on the tannoy and shouts "Scramble!" into the receiver and across the airfield.

10.07HRS INTO THE AIR

Having raced to their planes, clambered into their parachutes and climbed into their aircraft, which fitters will already have started for them, pilots begin to taxi down the runway and take to the air.

10.10HRS MISSION BRIEFING

With the planes now airborne, through their headphones they hear "vector two five zero, bandits 200 plus, angles three zero", which is code for them to steer a course for 250 degrees, where more than 200 enemy aircraft are incoming at 30,000 feet.

10.15HRS BANDITS DEAD AHEAD

Enemy planes are spotted heading in from the east with the sun behind them. A dogfight begins, as planes begin one-on-one duels with the German fighters, or go after the slow-moving bombers that are bristling with guns.

10.40HRS THE FIGHT ENDS

German fighters can only fight over English airspace before their fuel starts running out. The RAF pilots then either chase them back over the Channel or pick off any remaining bombers.

11.00HRS RETURN TO BASE

Those pilots that haven't been shot down return to base. Upon landing they are interviewed by an intelligence officer who compiles a combat report detailing any enemy and RAF planes that have been shot down or damaged.

15.00HRS SECOND DUEL OF THE DAY

Pilots are scrambled again. At the height of the campaign, pilots flew combat missions two or even three times a day.

20.00HRS DISMISSED AT DUSK

As dusk approaches, after 16 long hours of suspense punctured by minutes of extreme violence in the skies, the pilots are stood down. Those who have survived end their day with a pint at the local.

WALERIAN ŻAK

NATIONALITY: POLISH
RANK: FLYING OFFICER, 303 SQUADRON

The pilot who was fighting to free his homeland from the only place left that he could still take on the Nazis

08

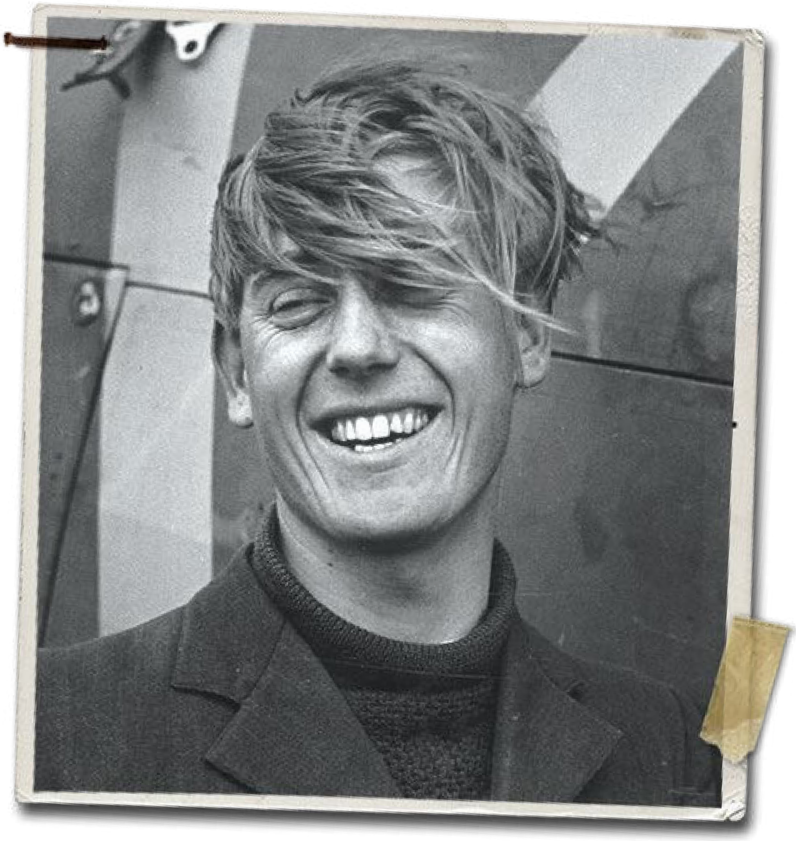
Many exiled Poles flew with the 303 Squadron, men who'd seen first hand what the Nazis did to countries they conquered. Many also had families in occupied territory and this may partly explain their fearsome reputation and never-say-die attitude. Walerian Żak, who'd go on to lead the squadron, summed up these qualities on the morning of 27 September.

Żak's was one of 11 pilots who attacked a bomber formation protected by a mass fighter escort. Despite being heavily outnumbered, they shot down 15 aircraft including seven bombers.

Two pilots were killed and Żak's own plane caught fire. As did he. Bailing out was his only option, but fearing his parachute would catch fire too, Żak elected to free fall thousands of feet in the hope it'd extinguish the flames. His gamble worked and, though badly burned, the 29-year-old then opened his parachute and landed safely.

LEFT: Żak settled in Britain after the war. His medals, including the DFC he's being awarded here, can be seen today at London's Imperial War Museum.

BELOW: Despite his injuries, Lewis returned to active service within three months of being shot down. He later served in the Far East and survived the war.



ALBERT GERALD LEWIS

NATIONALITY: SOUTH AFRICAN
RANK: FLYING OFFICER, 504 AND 249 SQUADRON

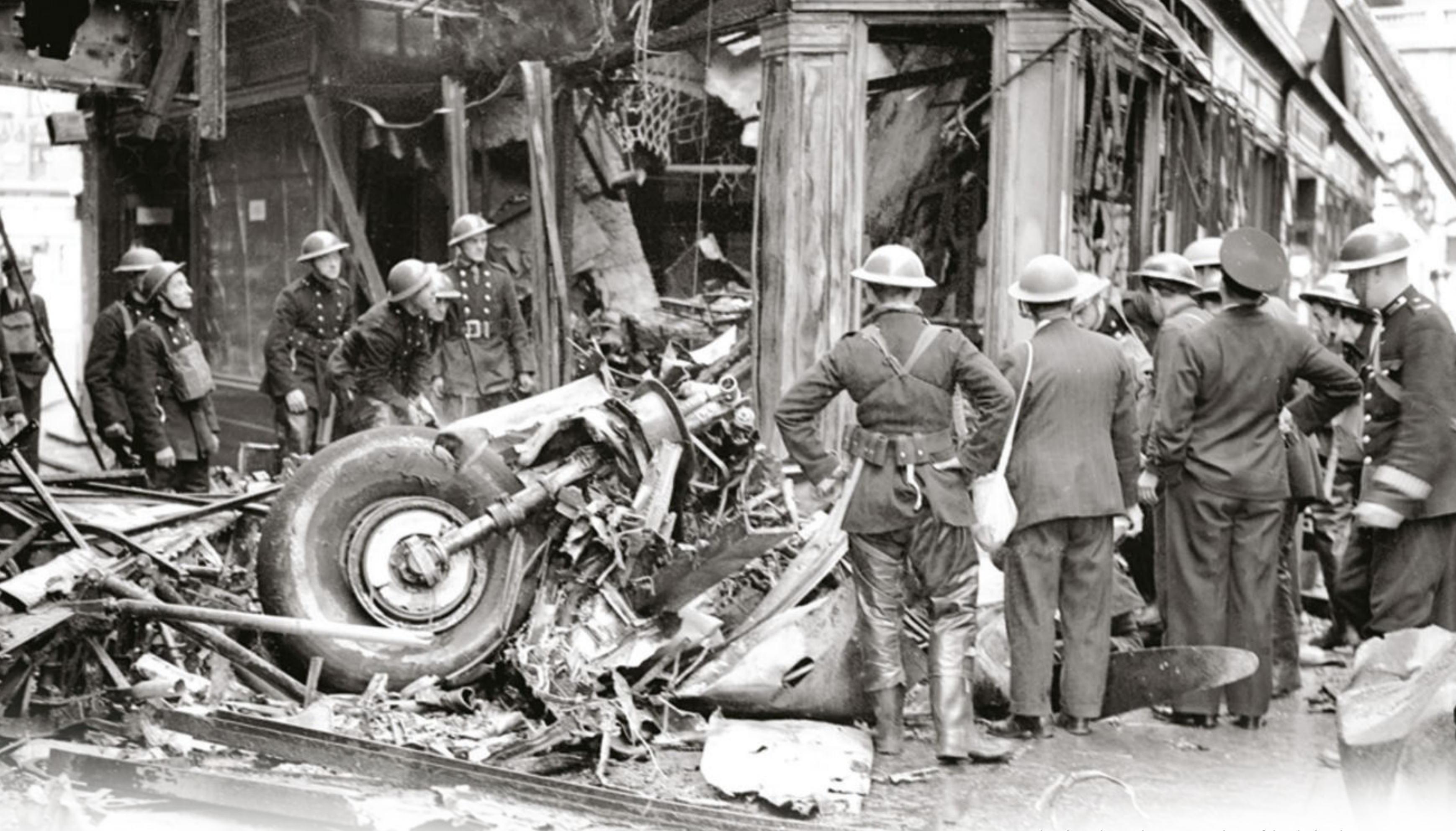
The courageous son of empire who gave nearly everything to defend what he would have called the mother country

09

As well as Britain and Europe, Fighter Command pilots came from all over the British Empire. One of the finest was South African Albert Lewis, and as the campaign began drawing to a close at the end of September, he experienced the best and worst that life as an RAF fighter ace offered. On 27 September, he shot down an astonishing six aircraft in one day, taking his tally for the war to 18. The very next day, however, he was shot down himself.

While returning from a patrol, the 22-year-old was jumped by a pack of German fighters. His plane was hit at 30,000 feet. Shrapnel tore through his legs and his Hurricane caught fire. Flying at 350mph, the blaze soon whipped up into an inferno. "When I pulled back the canopy," he later recalled, "the flames roared up around my face. I pulled the release of my harness and got out. The suddenness with which I parted company with the plane caused me to be shaken around like an old rag."

Lewis landed safely but had suffered severe burns to his legs, hands, throat and face. His eyes were also so badly scorched that he was blind for two weeks.



ABOVE: The plane that Holmes rammed out of the sky hit shops close to Victoria Station. His plane crashed nearby at Ebury Bridge on Buckingham Palace Road.

RAY HOLMES

NATIONALITY: ENGLISH
RANK: FLIGHT SERGEANT, 504 SQUADRON

This pilot's heroics saved Buckingham Palace from certain destruction - and he did it without bullets, too

10

By 11 October, the Battle of Britain was over. Hitler hadn't officially cancelled the invasion, but he had formally postponed it. It marked a true turning point in the war. It was Nazi Germany's first defeat and proof that the Führer's ideologically driven killers weren't invincible.

What didn't stop was the bombing of Britain, which only intensified over the next seven months as the Battle of Britain became the Blitz.

London had first been bombed on 24 August, accidentally and against the express orders of Hitler himself, as it turned out. But the revenge bombing of the city of Berlin by the RAF the very next day so infuriated him that the focus of the Battle of Britain was switched from destroying Fighter Command and its bases to destroying Britain's infrastructure.

On Sunday 15 September, a force of 100 bombers and 200 fighters approached London. As they were tracked by the radar station at Uxbridge, where Churchill just happened to be visiting, 250 fighters were despatched to deal with them.

By noon, the surviving bombers arrived over central London. Here, they were engaged by Hurricanes from 504 Squadron. One was being piloted by 24-year-old Ray Holmes, who attacked several bombers, before latching onto a badly damaged one heading straight for Buckingham Palace. Holmes wasn't to know, but the plane was actually unmanned. It'd been so badly shot up over south London that its crew had bailed out. Its pilot, Oberleutnant Robert Zehbe, had left the plane on a fixed course before parachuting to what he thought was safety. Coming down near the Oval cricket ground, however, he was attacked by an angry mob and later died of his wounds.

Crewless it may have been, but Zehbe's bomber still had a full payload. Holmes closed in behind it, lined it up in his sights, but he was out of ammo. The Liverpudlian then made a desperate decision. "There was no time to weigh up the situation," he revealed afterwards. "[The German] aeroplane looked so flimsy. I just went on and hit it for six. I thought my plane would cut right through it."

Flying at more than 400mph, Holmes rammed the German bomber's tail. It caused his Hurricane to plunge into a steep nosedive. He was forced to bail out, but the impact had snapped the bomber in two, and had flipped the remaining fuselage over that the g-force ripped both its wings off.

The bomb load then fell free, though part of it did hit the palace, the bulk missed. The plane was knocked clear. It ended up crashing by Victoria Station without further loss of life. Holmes's courage had ensured a vital part of Britain's heritage would survive the war.

GERMANY'S FIGHTER ACES

With 111 kills between them, the top three Luftwaffe pilots accounted for seven per cent of all RAF losses

OBERLEUTNANT HELMUT WICK

BATTLE OF BRITAIN KILLS: 42

Wick was the highest-scoring pilot of the battle. The 25-year-old became only the fourth member of the German armed forces to be awarded the King's Cross of the Iron Cross with Oak Leaf Clusters. He was killed in combat in November 1940.

MAJOR ADOLF GALLAND

BATTLE OF BRITAIN KILLS: 35

Galland would go on to become the youngest general in the German military, attaining the rank of general of the fighter arm in 1941. His total number of kills for the war was 104, despite being banned from combat between December 1941 and the end of 1944 by Hitler himself.

HAUPTMAN WALTER OESAU

BATTLE OF BRITAIN KILLS: 34

By the time the Battle of Britain started, Oesau was already a veteran of the Spanish Civil War, the invasion of Poland and The Battle of France; he had 14 kills. By the time he was killed in May 1944 by an American pilot, he'd extended that tally to 127.

SPITFIRE SCRAMBLE

A group of RAF fighter pilots race to their waiting aircraft after receiving the signal to "scramble!" Every minute lost before take-off would be advantageous to the enemy, as they could have allowed the pilots to gain extra height above the advancing plane formations.

X DV
B DV

SPITFIRE SM520

1948-1951

The two-seater version of a TR9, this Spitfire helped train future pilots for the perils of airborne warfare

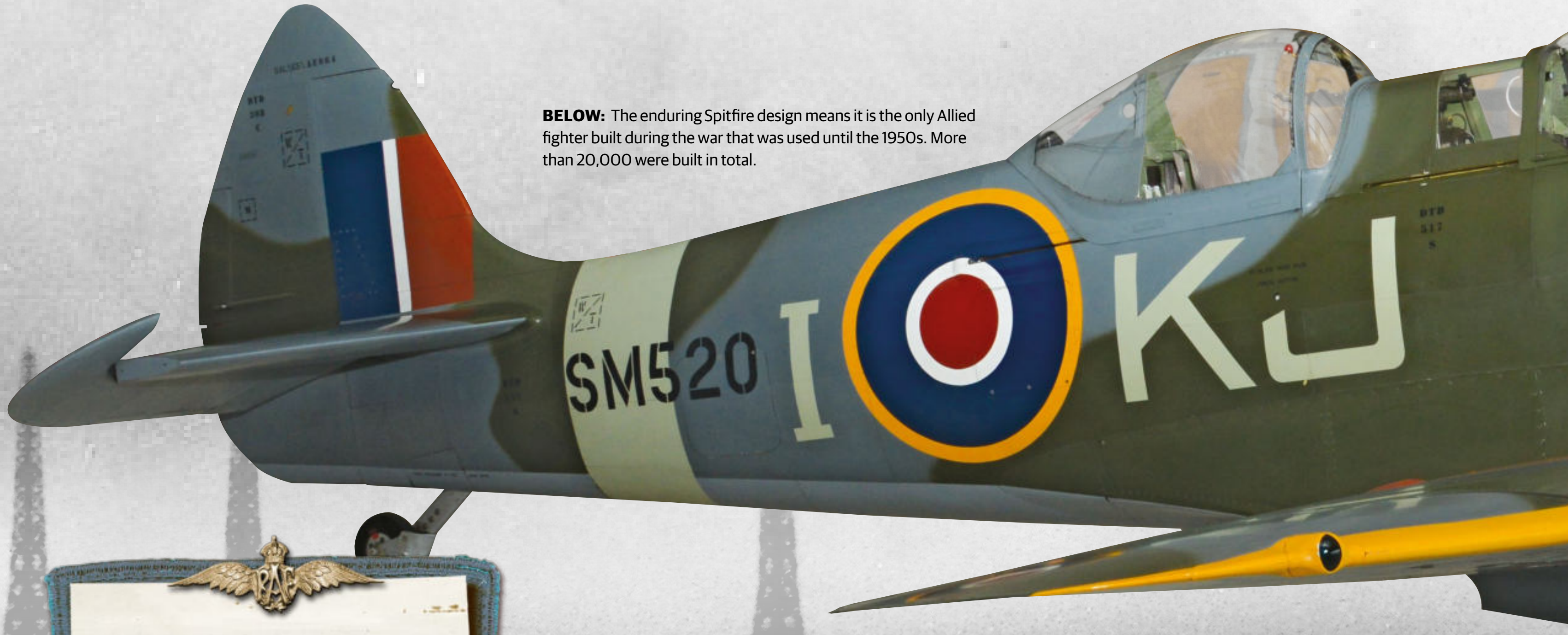
The Spitfire is almost ubiquitous when discussing Britain's war in the skies during War World II. There were 22 different versions of the classic interceptor fighter built during the height of its time in the RAF. One of these was the SM520, a two-seater plane based on the TR9 model, which itself came from a Spitfire Mk IX.

The conversion from one to two seats was a post-war program, with the first SM520 arriving in 1948. The project helped provide flight and gunnery practise for new recruits to the RAF, such as the Irish Air Corps (IAC) Seafire fleet and many other air forces in what was to become the Commonwealth of Nations.

This particular model was constructed as a one-seater TR9 in a West Bromwich factory and was first delivered to the RAF in November of 1944. As the war came to an end, the fighter was involved with the mass RAF disarmament measures and was sold to the South African Air Force (SAAF) for the sum of £2,000.

In Africa, it helped train pilots who were to be sent to the conflict in Korea and prepared them for flying in the American-made SAAF P-51 Mustangs. After a series of changes in ownership, the single-seat SM520 was converted into a two-seater in 2002, renamed G-ILDA (in honour of a previous owner's granddaughter) and was then passed on to the Boultbee Flight Academy, where it is currently located.

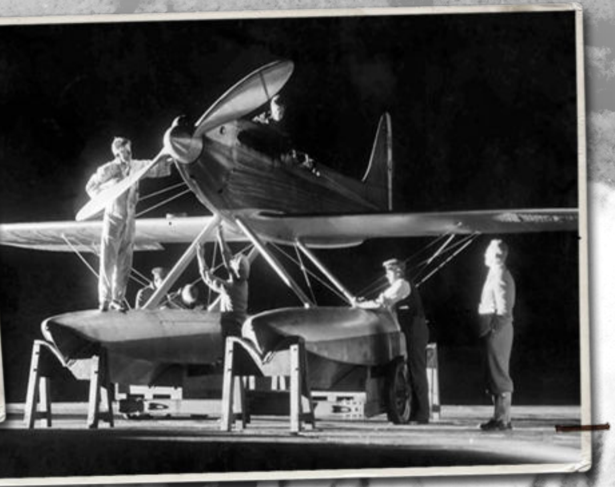
The original British paint scheme was revived and it is now in a camouflage grey/green scheme as seen on the European Standard Day Fighters that helped Britain defend its borders in its hour of need.



BELOW: The enduring Spitfire design means it is the only Allied fighter built during the war that was used until the 1950s. More than 20,000 were built in total.

SPITFIRE SM520

YEARS BUILT: 1948-1951
LENGTH: 9.58M (31FT 5IN)
WINGSPAN: 11.23M (36FT 10IN)
MAXIMUM SPEED: 644KM/H (400MPH)
RANGE: 724KM (450 MILES)
ENGINE: ROLLS-ROYCE / PACKARD MERLIN 266
CREW 2 (STUDENT VAND INSTRUCTOR)
ARMAMENT: 2 X .303 BROWNING MACHINE GUNS

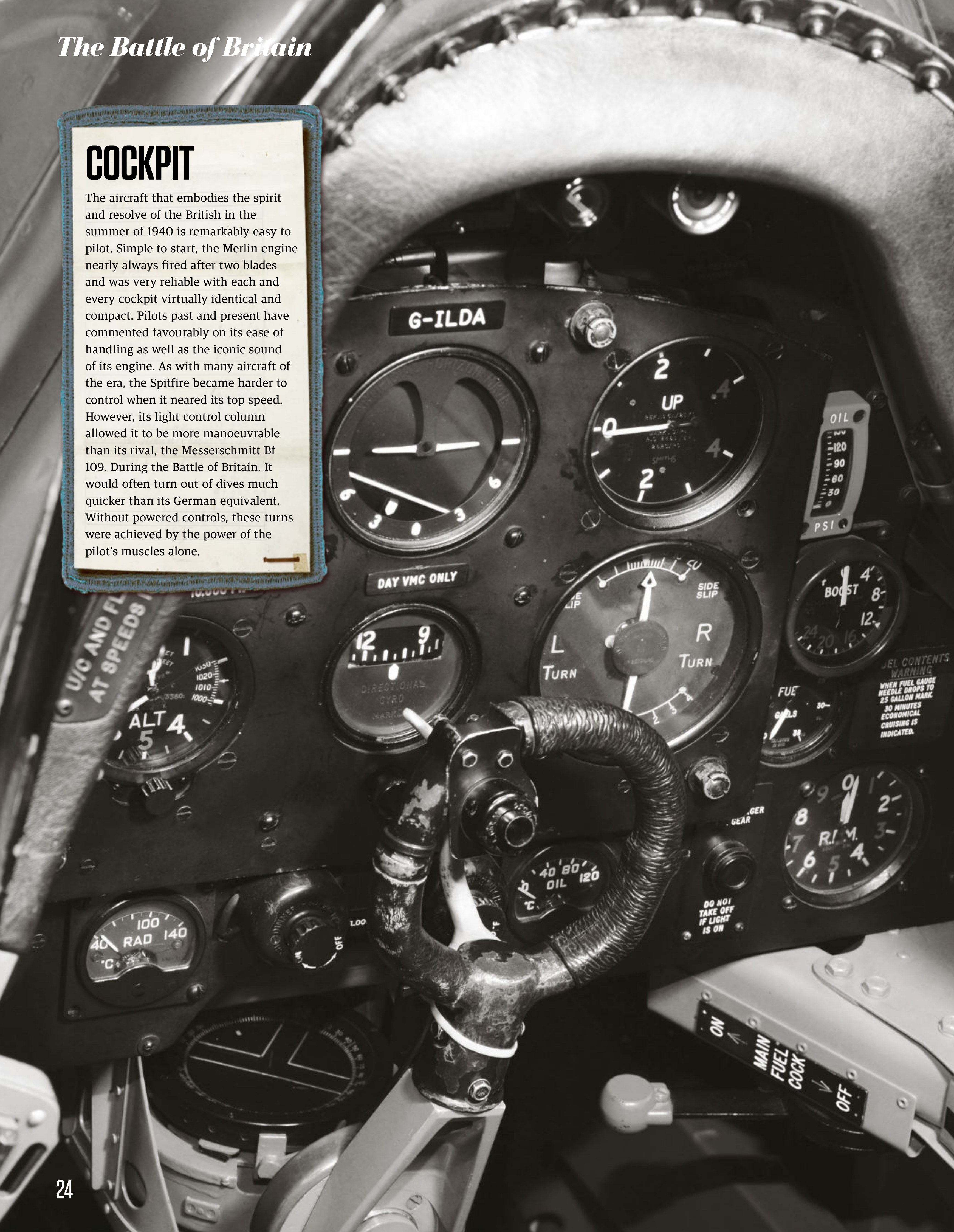


BOULTBEE
LDN
24V

RIGHT: Pilots of the 611 West Lancashire Squadron launching a Spitfire off Biggin Hill Airport in 1942.

COCKPIT

The aircraft that embodies the spirit and resolve of the British in the summer of 1940 is remarkably easy to pilot. Simple to start, the Merlin engine nearly always fired after two blades and was very reliable with each and every cockpit virtually identical and compact. Pilots past and present have commented favourably on its ease of handling as well as the iconic sound of its engine. As with many aircraft of the era, the Spitfire became harder to control when it neared its top speed. However, its light control column allowed it to be more manoeuvrable than its rival, the Messerschmitt Bf 109. During the Battle of Britain. It would often turn out of dives much quicker than its German equivalent. Without powered controls, these turns were achieved by the power of the pilot's muscles alone.


G-ILDA
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L TURN
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BOOST
DIRECTIONAL GYRO
ALT
U/C AND FL
AT SPEEDS
FUEL CONTENTS WARNING
WHEN FUEL GAUGE NEEDLE DROPS TO 25 GALLON MARK. 30 MINUTES ECONOMICAL CRUISING IS INDICATED.
R.P.M.
OIL
RAD
DO NOT TAKE OFF IF LIGHT IS ON
ON
MAIN FUEL COCK
OFF

MAXIMUM DIVING SPEED
400 M.P.H. I.A.S.
NO SMOKING
SOLO FLIGHT PERMITTED FROM THE

BELOW: The cockpit of the SM520 is authentic, down to the spade-like control column and the throttle control on the sidewall.

BELOW: Unlike the Messerschmitt, the Spitfire never took to the use of cannon and relied on its dual machine guns.

ABOVE: When not in use, the opening of the machine gun's barrel was taped to prevent the mechanism from freezing at high altitudes.

GUNS

In the summer of 1940, the RAF had a foolproof plan against the oncoming Luftwaffe. The Hurricanes would go after the German Junker 87 and 88 bombers while Spitfires would face off against the fighters. This decision was tailor made for the RAF aircraft, as the guns on the Spitfire were positioned narrower than those on the Hurricane, making it easier to engage the Messerschmitt fighters. At full capacity, the Spitfire could have eight Browning machine guns with 300 bullets. The amount of bullets at a pilot's disposal meant those with poor aim could at least hit something.

THE MESSERSCHMITT BF 109

INSIDE THE SCOURGE OF THE SPITFIRE AND THE LUFTWAFFE'S BACKBONE

Fresh from preparation in the Condor Legion in the Spanish Civil War, the Luftwaffe's Messerschmitts were ready to take the battle to the British over the Channel. 33,000 were made in total during the war and it provided the spine of the Luftwaffe fleet. The Messerschmitt only had two machine guns but these contained magazines of 1,000 rounds each.

They had two 20mm cannons – useful against bombers, but they struggled to cope with the manoeuvrability of Spitfires and Hurricanes. Its Achilles heel was its short range, preventing it from doing more damage. Despite its loss in the Battle of Britain, the Bf 109 shot down the most Allied planes in the war. Its longevity was due to its simple and direct design and was still frequently used even in the later years of the war when the jet-powered Me 262 came into production.

BELOW: Serving across all fronts and in all theatres, the Bf 109 was integral to the Nazi war machine.

EMBLEMS AND DESIGN

With its origins in World War I, the RAF roundel was used to identify British planes from the ground and in the heat of a dogfight. The Union Flag was initially put forward but due to its likeness to the German cross, the roundel was incorporated.

The first Spitfires were painted brown and dark green while the underside fuselage was white to allow for easy identification. As the fight against the Luftwaffe approached the Channel, the paint scheme changed from brown to grey as the new colour blended in with the sea. This was employed from then on with the odd variation. These included pink or dark blue for reconnaissance missions at low and high levels respectively and light brown for Middle East missions. Even the roundel was dropped, as in operations over Japan it was deemed too similar to the red disk Hinomaru emblem of the Japanese Zeros.

BELOW: After the Battle of Britain, the Spitfire assumed more of a reconnaissance role and was even occasionally painted in pink to add to its camouflage.

ABOVE: Prince Harry is flown in the back of Boultbee's restored Spitfire SM520 over the Isle of Wight needles.

9G
P
MJ627
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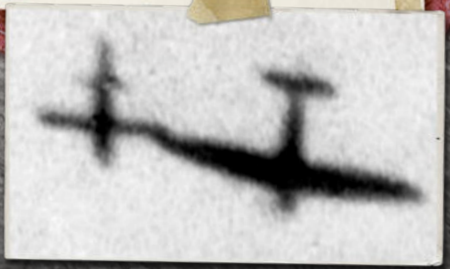
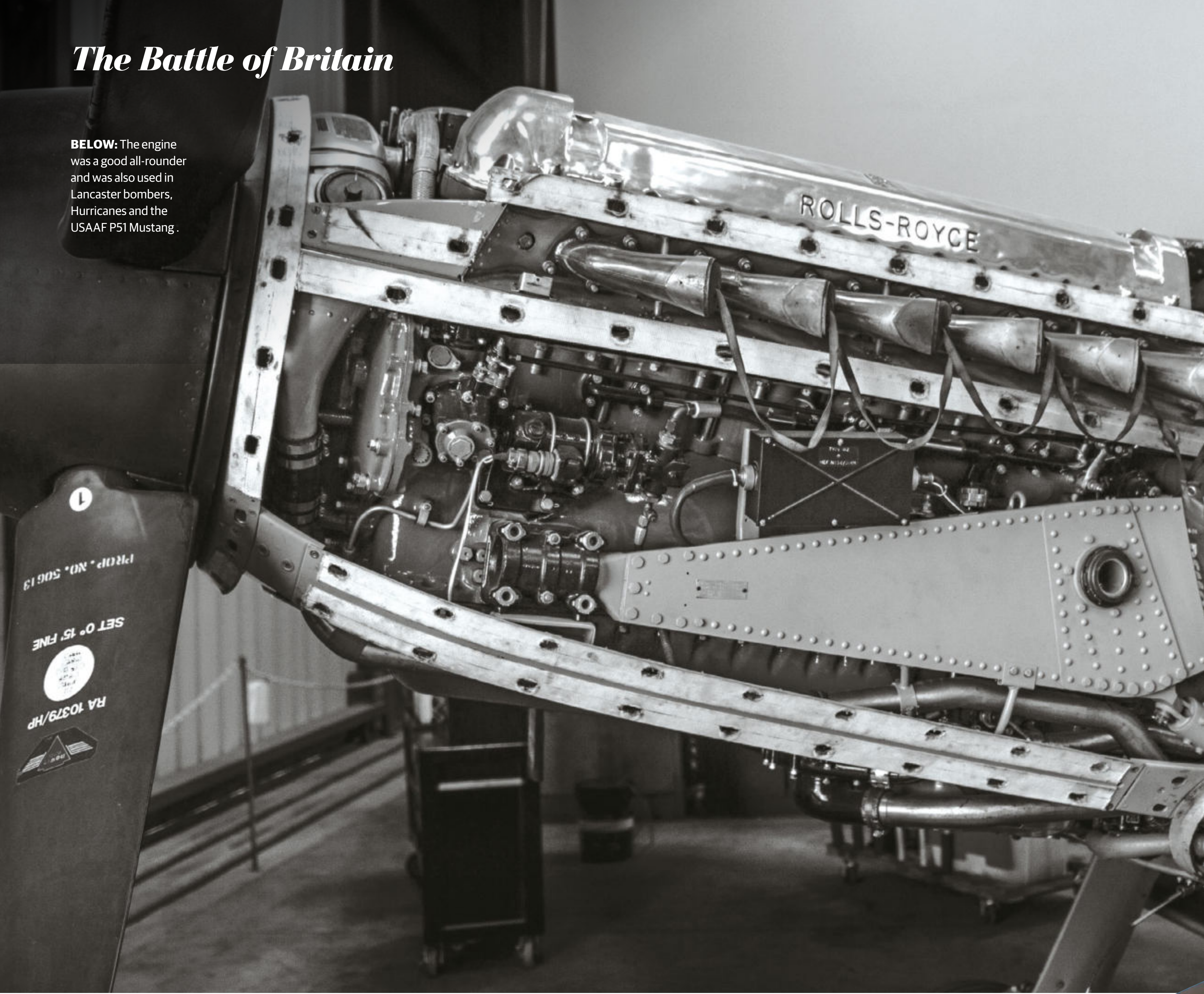
I
SM520
Rolls-Royce

ADLERTAG

On 13 August 1940, better known as Adlertag or 'Eagle Day', the Luftwaffe appeared over the skies of Kent and Sussex, beginning the Battle of Britain. The Spitfire is famous for Britain's resounding victory, but in the following months and years, the RAF and the Luftwaffe jostled for air supremacy. The constantly updated Messerschmitts actually began to outperform the Spitfire by 1941, but the British clawed back the advantage with the development of the better and faster engines in the Spitfire IX. With this new power system, the Spitfires and Seafires had a much broader role in the RAF and Royal Navy. The improved models could now take down V-1 rockets before they hit their target, saving many lives and cities in southern England.

BELOW: Spitfire pilots would attempt to stop a German V-1 by nudging it off course.




ROLLS-ROYCE
PROP. NO. 50613
SET 0° 15' FINE
RA 10379/HP

BELOW: The engine was a good all-rounder and was also used in Lancaster bombers, Hurricanes and the USAAF P51 Mustang .

SPITFIRE VS HURRICANE

WHICH BATTLE OF BRITAIN MACHINE WAS THE SUPERIOR FIGHTER CRAFT?

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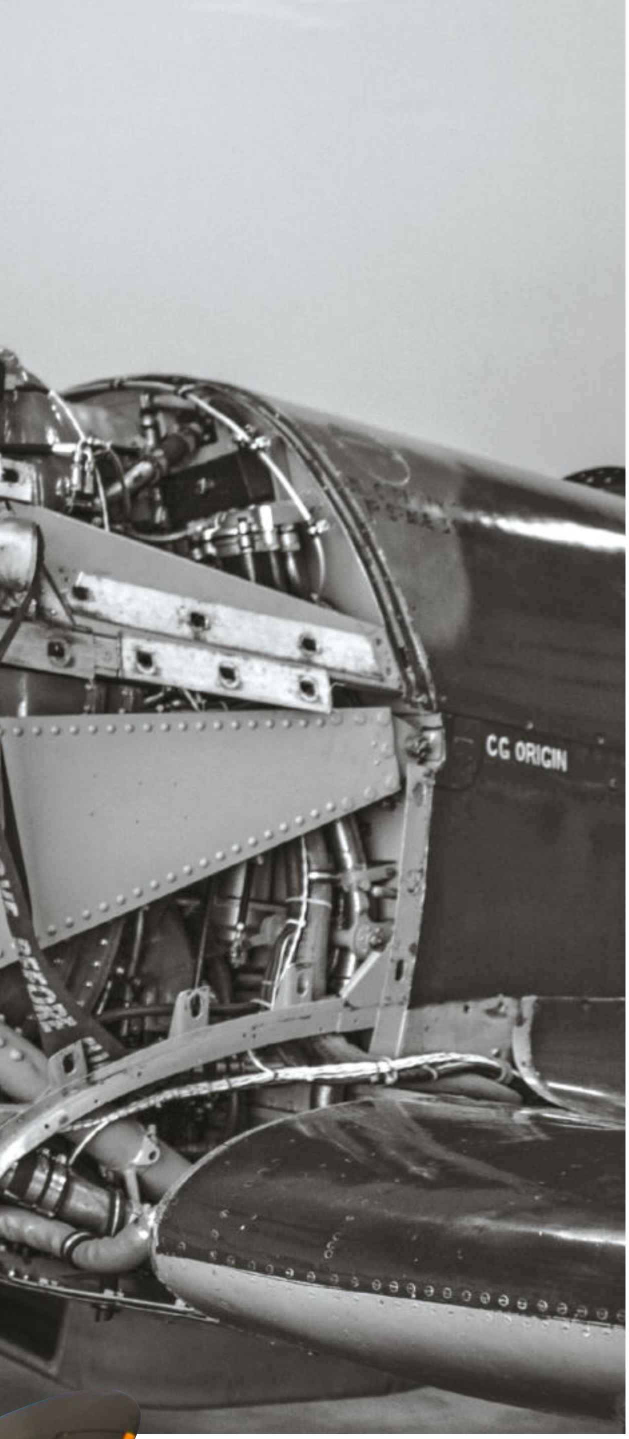

THE MERLIN ENGINE

THE POWERHOUSE BEHIND THE SPITFIRE'S ICONIC SOUND

Despite being used in more than 40 aircraft during World War II, the Merlin is most commonly associated with the Spitfire. Named after the bird of prey, the engine first took to the skies in February 1935 and was a marked improvement on the previous Rolls Royce instalment, the Kestrel.

The engine was so good that both the Spitfire and the Hurricane were built to accommodate it. As efficient as it was, the Merlin certainly wasn't without its faults. Unlike the engines of the German Messerschmitts, the Merlin wasn't fuel-injected, so there was a danger of it cutting out in steep dives.

However, this was mostly fixed in 1941 by the addition of a new diaphragm in the engine's float chamber. This was affectionately known as the 'Miss Shilling's Orifice' after its designer Tilly Shilling. Even after World War II the Merlin was still in assembly, and production only ceased in 1950 after 150,000 had been made to help Britain win the war.

BELOW: The Spitfire was very nearly called the 'Shrew', which wouldn't have been quite as intimidating .

SUPERMARINE SPITFIRE

MAXIMUM SPEED: 608KM/H (378MPH)
RATE OF CLIMB: 812M (2,665FT) PER MIN
CEILING: 10,668M (35,000FT)
ARMAMENT: 2 X 20MM HISPANO MK II CANNONS4 X .303 CAL BROWNING MACHINE GUNS 2 X 240LB BOMBS
LONGEVITY: 1938-48 (20,351 MADE)

HAWKER HURRICANE

MAXIMUM SPEED: 547KM/H (340MPH)
RATE OF CLIMB: 847M (2,780FT) PER MIN
CEILING: 10,972M (36,000FT)
ARMAMENT: 4 X 20MM HISPANO MK II CANNONS2 X 250LB BOMBS OR 1 X 500LB BOMB
LONGEVITY: 1937-44 (14,583 MADE)

BELOW: The Hawker Hurricane served in all major theatres of World War II.

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Images: Alamy, Getty

BATTLE IN THE SKIES

No other battle in recent British history has been accorded the same status as the Battle of Britain, fought out over the skies of England in the summer and autumn of 1940 between the Royal Air Force and the German air force. The Battle followed on from the defeat of France in June 1940 and the expulsion of British forces from Continental Europe during the Dunkirk evacuation. The general expectation in Britain was of a German invasion at some point later in 1940. One way of ensuring that invasion might be postponed was to deny the German forces air superiority over southern England. The onus of achieving this fell on RAF Fighter Command. The failure of the German air force to eliminate British fighter defences played a critical part in persuading Hitler and his commanders that invasion was too risky.

Fighter Command was not the only reason that Hitler hesitated. Deteriorating weather, the threat of a powerful Royal Navy and the prospect of Bomber Command attacking the invasion beaches were all factors that contributed to the decision not to invade. But if Fighter Command had failed in its task of preventing the enemy from dominating the skies of southern England, the outcome might have been different. This

victory depended on many things, including the radar detection screen and high levels of aircraft output and pilot training. The many factors that affected the battle are explained in what follows. This book is an invitation to explore the contest from many different angles. Each spread is rich in photographs and images from the time. There are also documents, maps and diaries that bring alive the sense of what it was like to endure that dangerous summer when it seemed that the German army, only 35 kilometres (22 miles) away across the Channel, might soon be tramping along English roads. The conflict certainly did not decide the war, which was won only five years later with powerful Allies at Britain's side. But it ensured that Britain, unlike much of the rest of Europe, did not have to come to terms with defeat and occupation. Like the destruction of the Spanish Armada 350 years before, the Battle of Britain has won a legendary place in Britain's island history.

Richard Overy, 2010

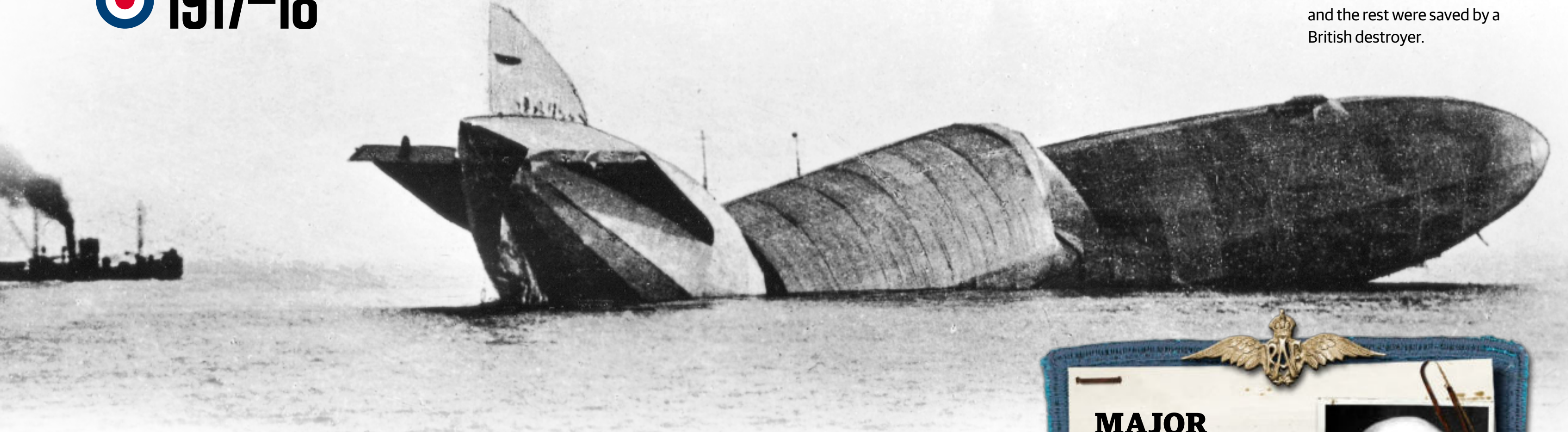
BELOW: The wreckage of one of the first two German aircraft shot down on British soil, a Heinkel He 111 bomber which crashed near Edinburgh in Scotland on 16 October 1939. The bombers were caught by two Spitfire squadrons as they attacked shipping in the Firth of Forth.

CHURCHILL INSPECTION

While en route to inspect defences in Kent, a Messerschmitt Me 109 crashed near Dover, at Church Whitfield. On seeing the wreckage, Churchill stopped the car to inspect the scene, joined by his bodyguard.

THE FIRST BATTLE OF BRITAIN

1917–18



BELOW: The wrecked German Zeppelin L15 lies in the Thames Estuary after being shot down on 31 March 1916 by the anti-aircraft battery at Purfleet. One of the crew members drowned and the rest were saved by a British destroyer.

When a German aircraft dropped a bomb on the port of Dover on 24 December 1914, it marked the first successful aerial attack on British soil. What followed was an intermittent series of attacks that increased in intensity by the middle of the First World War and petered out again after May 1918, six months before the war's end. In total, Britain was subjected to 51 attacks by German airships and 52 attacks by aircraft. This was on a small scale compared with the air battles of the Second World War, but the first Battle of Britain had important repercussions for the greater battle fought a generation later.

Air power was in its infancy in 1914 and the German decision to attack British targets from the air was based on unfounded speculation about the possible effects of aerial bombing. Most of the early attacks were undertaken by a few aircraft at a time and their impact was negligible. More dangerous was the German decision to undertake an offensive using airships, most of them the famous Zeppelins, that could carry large loads of bombs of varying calibre and which were at first virtually free to roam over British territory. The first airship attack was made on the night of 19–20 January 1915 and the last was mounted on 5–6 August 1918.

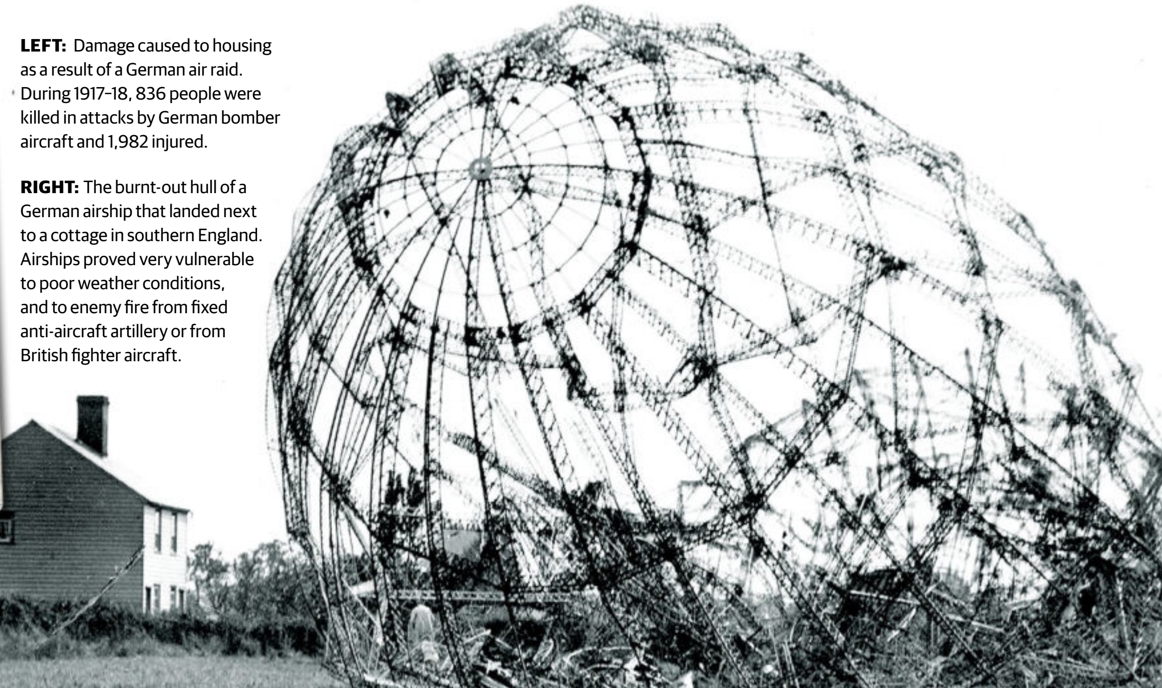
The threat posed by air attack was met at first by anti-aircraft guns stationed around vulnerable areas of the south-east of England and a limited number of fighter aircraft. The airships faced great difficulty in navigating successfully and unloaded their bombs when and where they could, but the efforts of the few defensive squadrons of the Royal Flying Corps were equally hampered by weather, slow speeds and a lack of suitable armament for destroying airships. Gradually, improved fighter aircraft managed to inflict losses on the Zeppelin fleet, but it was impossible to disguise the inadequacy of much of the early air defence effort.

Yet by the end of 1916, the airships had dropped only 160 tons of bombs in two years. Neither side was in a position to do anything very decisive in the air war over Britain. The situation changed with the German decision to mount a campaign

MAJOR GENERAL SIR FREDERICK SYKES (1877–1954)

Appointed in April 1918 as the second chief of the air staff in succession to General Trenchard, Frederick Sykes had the task of nursing the fledgling RAF through its first year. Sykes joined the army as a volunteer at the start of the South African War (1899–1902) and gained a full commission in 1901. In 1911, he learned to fly, and in the pre-war years played an important part in the formation of the Royal Flying Corps. He became its first chief of staff in 1914 under General Sir David Henderson, but arguments with the army over the use of aircraft led to a posting to the Royal Naval Air Service in the Mediterranean. In 1918, he took up his role as chief of staff of the new RAF, a position he held until January 1919 when he went to the Paris peace talks as head of the British Air Section. He ran civil aviation in Britain for three years from 1919 and entered parliament as a Conservative. He retired from politics in 1945.

LEFT: Damage caused to housing as a result of a German air raid. During 1917–18, 836 people were killed in attacks by German bomber aircraft and 1,982 injured.



RIGHT: The burnt-out hull of a German airship that landed next to a cottage in southern England. Airships proved very vulnerable to poor weather conditions, and to enemy fire from fixed anti-aircraft artillery or from British fighter aircraft.

ALL CLEAR ALL CLEAR
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SC
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ABOVE: The early air attacks called for improvised civil defence. Here a car carries the "all clear" sign after an air alarm in October 1917, a month when south-east England was attacked both by Gotha bombers and by Zeppelins. By this stage of the war Britain was already using "black-outs" in threatened areas at night.

FIELD MARSHAL JAN SMUTS (1870–1950)

Jan Smuts played a key role in the creation of the Royal Air Force. A former Boer commander in the South African War, Smuts fought on the British side in Africa during the First World War before coming to London as a member of Lloyd George's war cabinet. It was in this capacity that he chaired the committee that organized the air defence of London in 1917 and recommended the formation of an independent air force. In August 1917, his proposals were accepted and, despite army opposition, a bill to create an air force passed through parliament in November. Smuts foresaw the widespread use of bomber aircraft in a new strategic role. After the war, he attended the Paris peace conference and then returned to a political career in South Africa where he became prime minister in 1919. He was a close friend and adviser of Churchill during the Second World War, and played a part in drafting the United Nations Charter in 1945.

in 1917 using heavy bombers. In the spring of 1917, the German high command was looking for a way to bring pressure to bear on Britain to pull out of the war. Alongside unrestricted submarine warfare they chose air attacks on London as a possible way of undermining popular war-willingness among both the public and politicians. The plan for a long-range bomber assault had been proposed by General Ernst von Hoeppner. Under his guidance the so-called "England Squadron" was activated, commanded by Captain Ernst Brandenburg. Using heavy aircraft produced by the Gothaer Waggonfabrik – usually known as Gotha bombers – the squadron made its first attack in daylight on 25 May 1917 against the Kent port of Folkestone, killing 95 people.

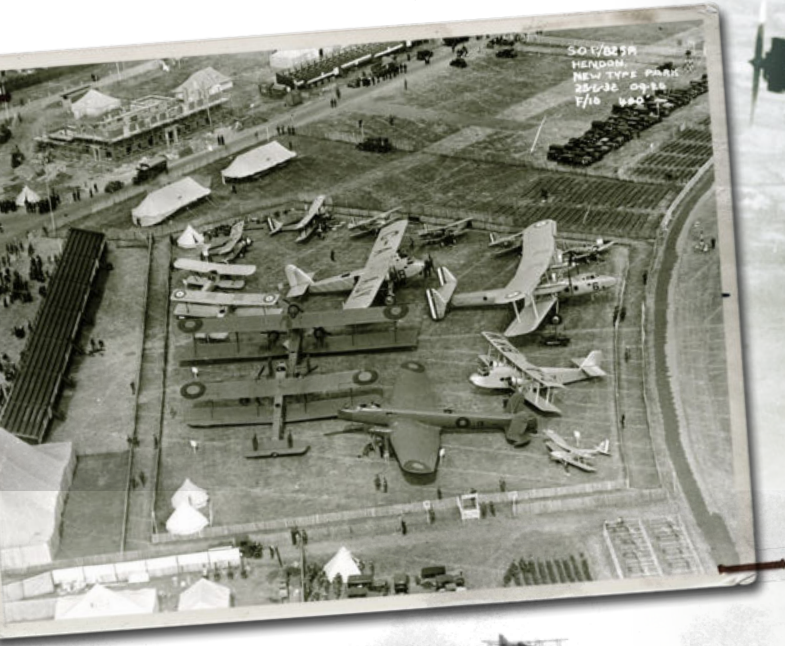
The public response was of panic and anger. When a raid on 12 June hit a school in the London district of Poplar, killing 18 children, the outrage was intense. The bombing raids had an immediate effect. The London Air Defence area was set up and large numbers of anti-aircraft guns, searchlights and fighter aircraft made available. A war cabinet committee under General Smuts sat to consider possible solutions, and his recommendation of the creation of an independent air force paved the way for the foundation of the Royal Air Force, which was formally established on 1 April 1918 with a strength of 165,000 men. The air defence system was overhauled by Brigadier General Edward Ashmore so that proper warning could be given.

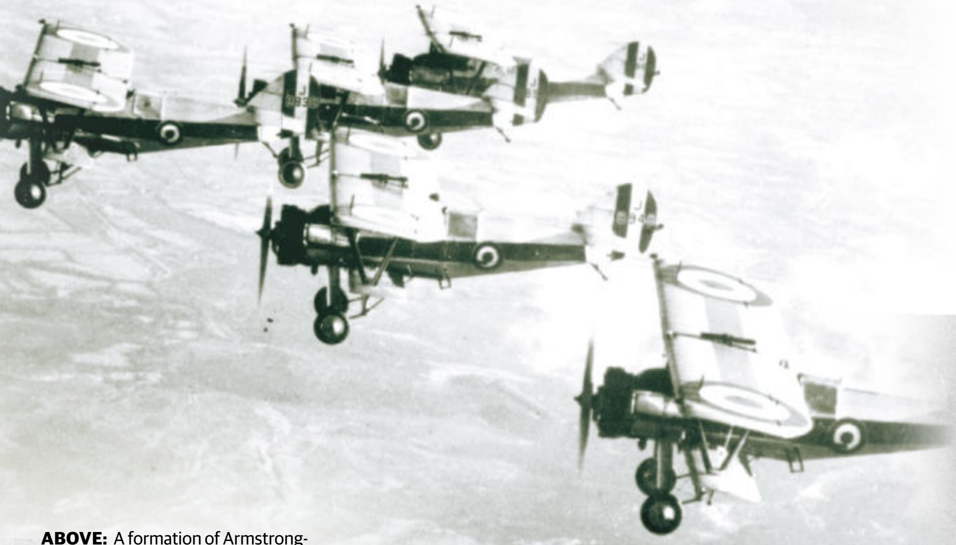
By the end of the war, London was defended by 304 guns, 415 searchlights and 11 fighter squadrons of 24 aircraft each. The result in autumn 1917 was to force the German bombers to shift to night raids, which made accurate bombing impossible. British night-fighters began to impose heavier losses on the attacking force and by May 1918 the German offensive came to an end. The 103 attacks had resulted in 1,400 deaths and 3,400 serious injuries. The strategic result was in the long run disastrous for the German side. Britain remained in the war but also came to understand the nature and limitations of air defence. In 1940 Britain would be much better prepared for an air assault than it had been in 1917.

BELOW: Soldiers and onlookers surround a crashed German Gotha bomber in Kent. In total, 54 of the bombers were lost through enemy action or accidents. One was forced to land in neutral Holland.

AIR DEFENCE BETWEEN THE WARS

BELOW: An aerial view of the Hendon Air Display, held annually in the 1930s at the RAF airfield in north London. The display shows new aircraft models on show to the public.



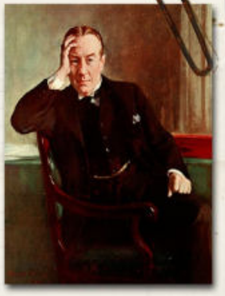


ABOVE: A formation of Armstrong-Whitworth Siskin aircraft from 41 Squadron RAF in flight. The single-seat biplane fighter was designed by the motor company Siddeley Deasy in 1919 but was taken over by Armstrong-Whitworth two years later. It was noted for its high aerobatic performance and was a favourite at air displays. It was retired from service in 1932.

The development of the RAF during the interwar years suffered from an evident contradiction. On the one hand, most leading airmen and air theorists assumed that air power was most effective when used in an offensive bombing role. On the other, Britain's evident vulnerability to air attack, demonstrated during the First World War, made the development of an effective air defence against enemy bombing imperative. For much of the interwar period, it was assumed that the balance of advantage lay with the attacking bomber aircraft. The difference in performance between fighters and bombers was too small to give fighters much chance of getting into the air, finding the enemy and shooting them down. The general view was that possession of a bomber force which could threaten a potential enemy, a posture that was called deterrence, would be sufficient defence against attack. Not until the mid-1930s was this view finally challenged by the development of a sophisticated air defence system in the United Kingdom, the only one of its kind in existence when war broke out in 1939.

In 1925, the RAF was reorganized under the title Air Defence of Great Britain. The bomber squadrons were concentrated on airfields in the central and southern areas of the country, and the fighters in a narrow belt to the south of London. For much of the next 10 years the only likely enemy was considered to be France and aircraft were deployed to meet that implausible threat. After 1933, the rise of Hitler's Germany created a menace which the existing ADGB organization was inadequate to face. In 1936, the ADGB was abolished and replaced with separate functional commands – Bomber Command, Fighter Command and Coastal Command. The forces were then redistributed to meet the more likely German challenge. Bomber bases were shifted to eastern England, in Yorkshire, East Anglia and Lincolnshire, where beforehand there had been

STANLEY BALDWIN (1867–1947)



The Conservative politician Stanley Baldwin is perhaps best remembered for his remark made in the House of Commons on 10 November 1932 that "the bomber will always get through". His view of future air war as something that would utterly destroy civilization played an important part in shaping popular fears of bombing during the 1930s. He was three times prime minister between 1923 and 1937. Under the National Government, set up in 1931, he was effectively deputy prime minister with the title of Lord President of the Council. It was during this period that he played a part in helping to set up the Disarmament Conference in Geneva and it was partly from the hope that he could achieve a real measure of disarmament in the air that he embarked on his scaremongering campaign. When he became prime minister in 1935, he oversaw the early stages of British rearmament, despite his lasting commitment to appeasement, seeing it as a better way to avoid the prospect of a terrible war.

BELOW: An event at the Hendon Air Display in 1928. A favourite feature was to stage a mock bomb attack on a reconstructed African or Arab village, a form of combat known in British Empire conflicts as "air policing".

only a single RAF base. Fighter aircraft were redeployed to cover the whole area of southern and eastern England, from Southampton to Newcastle. By 1939, there were 138 airfields instead of the 52 available five years before. Fighter Command was supplemented by a chain of radar stations, developed between 1936 and 1939 to give early warning of approaching aircraft, and by ground observers to track incoming aircraft. From 1936 onwards, under pressure from the government, the RAF also shifted the balance between bomber and fighter production, which had previously favoured offensive aircraft. By the outbreak of war, the RAF was structured both to defend against an enemy air offensive and to mount an offensive against the same enemy on the untested assumption that their opponent's defence against bombing would be less adequate than the RAF's own.

BELOW: Two young children try out the new respirators (gas masks) distributed to almost everyone in Britain during 1939 and 1940. Beside the standard adult mask was a special respirator for babies and the small children's mask illustrated here.

The government was also aware that the threat of bombing created widespread public alarm. Alongside the advent of an active air defence came developments in ground defences and civil defence. Anti-aircraft artillery had been used in the First World War and although its effectiveness was questionable, the presence of guns helped to reassure the local population. In 1937, an Ideal Plan was formulated for a system of guns, searchlights and barrage balloons. By 1939, only 570 heavy guns had been made available out of a planned 1,264, but much of the shortfall was made good in the first nine months of the war.

More important for public morale were civil defence preparations. These had been almost non-existent when bombing began in the First World War. In 1924, the government set up an Air Raid Precautions Sub-Committee, run by the Home Office, whose task was to plan and prepare for possible bomb attack. During the 1930s these plans were finally given real substance. In 1937, a comprehensive Air Raid Precautions law was introduced, requiring local authorities to establish a nationwide ARP structure, to be organized and supervised by Regional ARP Commissioners. Huge numbers of volunteers came forward to act as air raid wardens and emergency personnel. By 1940, there were 828,000, including 108,000 full-time civil defence workers. Local councils were obliged to begin a programme of air-raid shelter construction and, together with the police, to organize exercises in blacking out towns. By 1939, Britain was the only country to distribute a gas mask to every man, woman and child (on the assumption that a ruthless enemy was almost certain to use gas or germ warfare in the event of war). A comprehensive evacuation scheme was prepared for children and mothers, to come into force as soon as war was declared. The system was far from complete when war did eventually break out, but it was sufficiently advanced to provide a measure of warning and shelter to most of the threatened population.

AIR CHIEF MARSHAL SIR CYRIL NEWALL (1886–1963)

The most important post in the RAF during the Battle of Britain was held by the chief of the air staff Cyril Newall. He began his military career in the army in 1905, learned to fly in 1911, and served in the Royal Flying Corps during the First World War, reaching the rank of brigadier general. In 1917 he was assigned to organize an aircraft wing for retaliatory raids on Germany and became convinced that bombing could have serious strategic effects. He became deputy chief of the air staff between 1926 and 1931 and chief of the air staff in 1937. He played an important part in expanding the pre-war RAF, both its defensive capability and the power to hit back with heavy bombers. He protected the fighter force from Churchill's demands for more aircraft in the Battle of France, and remained in office until the end of October 1940, when that battle almost over. He became governor general of New Zealand until 1946.

BELOW: Workmen assigned to air raid precautions work dig trenches in London's Hyde Park on 28 September 1938. That day the British public waited to hear if war over Czechoslovakia had been averted. Fear of bombing dominated public anxieties during the crisis which ended with the Munich agreement, signed two days later.

FIGHTER COMMAND

1940

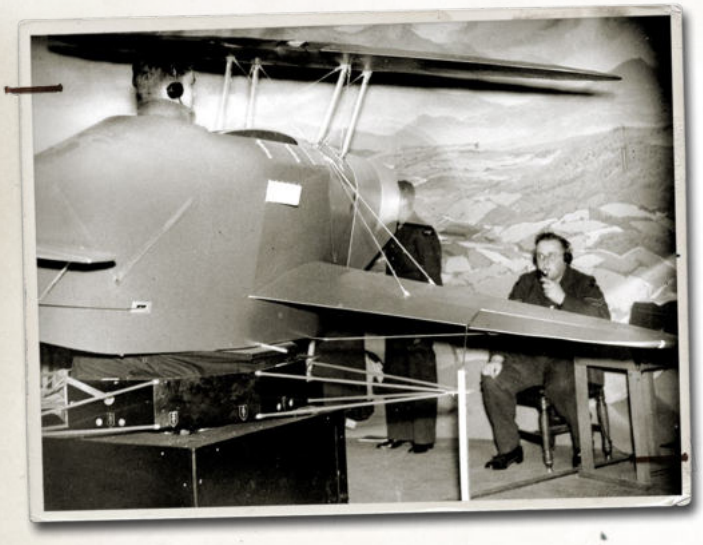
Fighter Command was only four years old when the Battle of Britain began. It formally came into existence on 14 July 1936 when the RAF was divided into four separate commands – Fighter, Coastal, Bomber and Training. The new force was placed under the command of Air Marshal Hugh Dowding and its headquarters sited at Bentley Priory on the outskirts of London. Although fighter squadrons had existed in the old air defence system, Dowding faced the remarkable challenge of having to create an entirely new and effective fighting organization in a matter of a few years.

The force was divided into a number of groups to defend particular geographical areas, and each group contained a number of sector stations where the operational aircraft were based. The south-east of England was defended by 11 Group; the Midlands and East Anglia by 12 Group; and the north and north-east of England were the responsibility of 13 Group. In response to the threat to Britain's ports and shipping, 10 Group was set up in July 1940 to defend the west and south-west. Eventually 14 Group and 9 Group were formed to protect Scotland and the north-west, particularly against attacks on naval shipping. The groups could collaborate and offer mutual support, but the operational commanders were responsible only for the sector aircraft covered by the territory of their group.

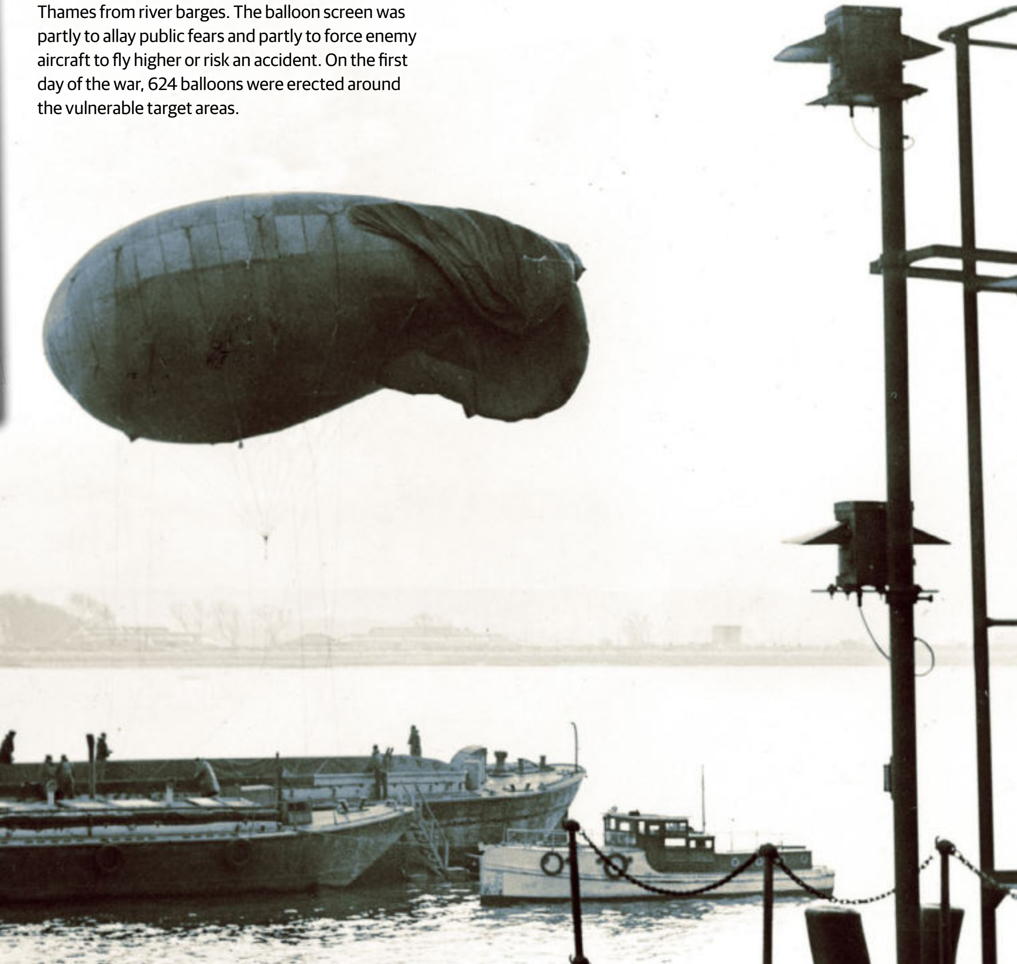
The heart of the new Command was the system of operational control and communication which allowed information on raids supplied by radar and visual observation to be fed back to Fighter Command headquarters and then passed on to the operational groups and sector stations. The central control of the fighter defence force made success possible in the Battle of Britain. Operations rooms were set up at Bentley Priory and at the Group headquarters. Here special map rooms were created which allowed the accurate plotting of incoming enemy aircraft and of the operations of the fighter forces scrambled to intercept them. Communication was by phone line, maintained by Post Office engineers. The information was taken from a chain of radar stations around the coast and from the men and women of the Observer Corps, staffed by volunteers to provide

BENTLEY PRIORY

The command headquarters of Fighter Command was based in the eighteenth-century country house of Bentley Priory in Stanmore, Middlesex. The house began life as an aristocrat's estate, but by the late Victorian age it was a hotel, and then briefly a girls' boarding school. The estate was bought by the RAF in 1926 and was originally the site of RAF Training Command. In the summer of 1936, the newly created Fighter Command moved its headquarters to the Priory from Uxbridge. Under its first commander-in-chief, Hugh Dowding, the Priory was modified to incorporate an operations room and filter room to allow close central command over the whole fighter force. The Observer Corps also moved to Bentley Priory and the Anti-Aircraft Command was stationed nearby. An underground operations block was added in early 1940 and was in use by March of that year, but the headquarters suffered almost no bomb damage throughout the war. The Priory was finally abandoned by the RAF in May 2008.



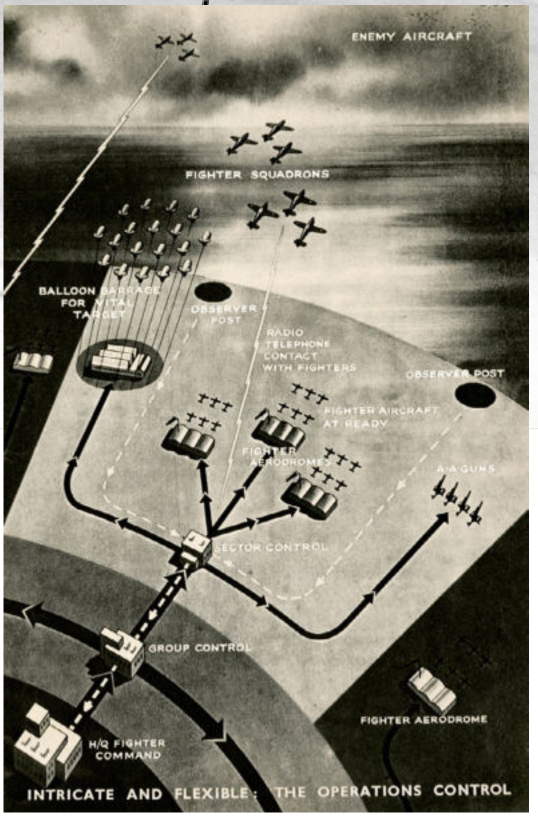
ABOVE: A trainee RAF pilot using a Link trainer in 1940. Fighter Command expanded its training programme as rapidly as possible after the outbreak of war to provide around 1,200 pilots available for operations for most of the battle.



BELOW: Barrage balloons being hoisted above the Thames from river barges. The balloon screen was partly to allay public fears and partly to force enemy aircraft to fly higher or risk an accident. On the first day of the war, 624 balloons were erected around the vulnerable target areas.

LEFT: A flight of three RAF Defiant fighters from 264 Squadron on 9 August 1940. The Boulton Paul Defiant was designed to be able to fire at bombers from below, from its rear turret, but it had no forward-firing armament. It was introduced in December 1939 but suffered heavy losses to superior enemy fighters.

BELOW & RIGHT: Two images show the importance of communication at the heart of the Fighter Command organization. **BELOW:** the filter room at Fighter Command headquarters at Bentley Priory where information from radar stations and the Observer Corps were marked on a large tabletop operations map. **RIGHT:** a schematic diagram of the whole structure of Fighter Command communication in 1940.



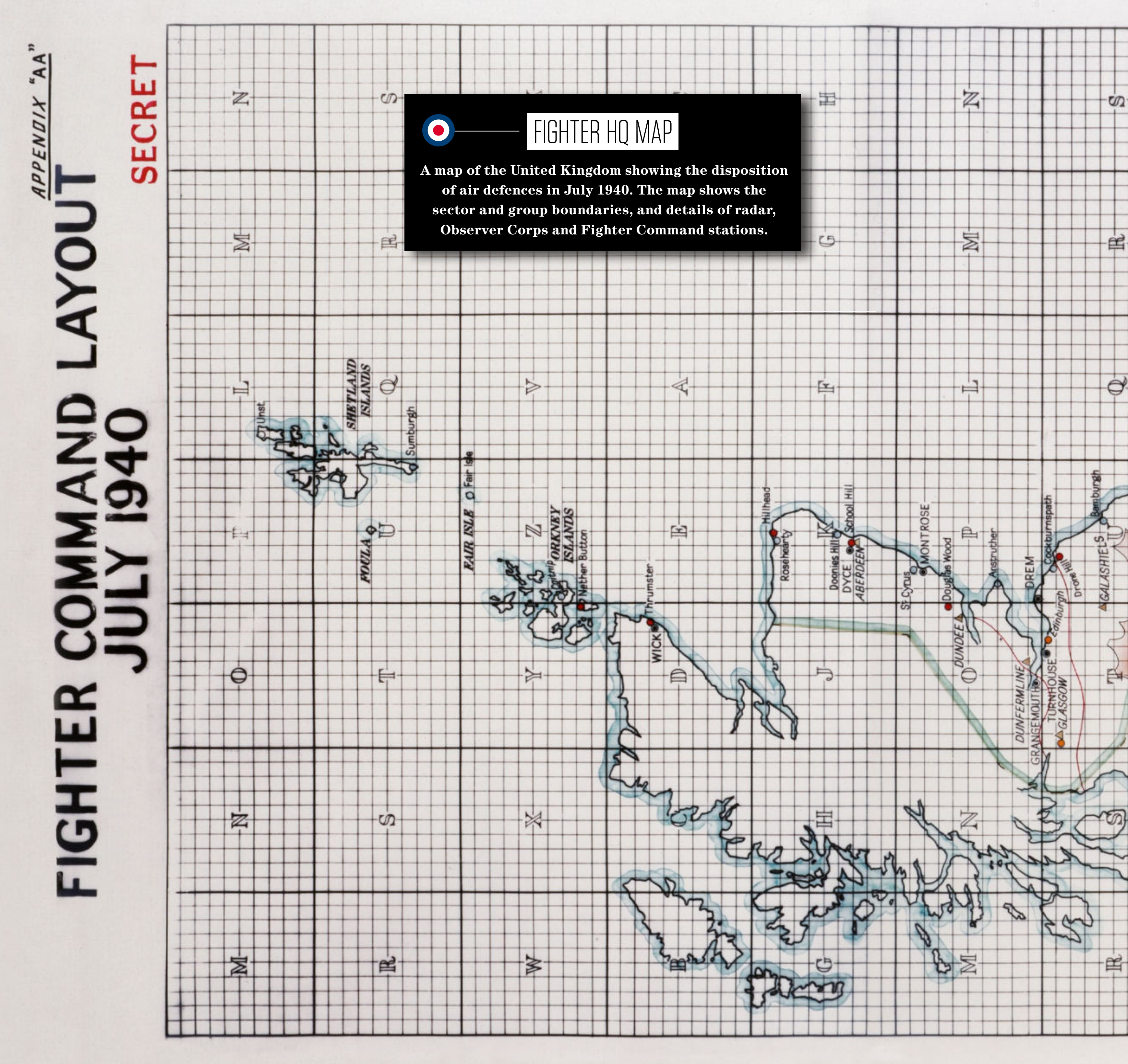
detailed information from ground observation of the direction and number of enemy aircraft. The corps came directly under Dowding's command and by 1940 comprised some 30,000 full-time and part-time members, organized into 32 different groups, each one made up of approximately 50 observer posts.

In addition to the Fighter stations and the Observer Corps, Dowding also acquired control over the Balloon Command set up under Air Vice Marshal Owen Boyd in November 1938 and the Army's Anti-Aircraft Command, led by Lieutenant General Frederick Pile, a personal friend of Dowding. His command headquarters was posted to Bentley Priory on 28 July 1939 and the two men had regular discussions day after day on potential defence priorities and tactics. The opposition offered by Fighter Command to the Luftwaffe in 1940 was greatly strengthened by the close integration of the fighter force with various other forms of static defence.

The force that Dowding led was slowly converted from obsolete biplanes to the fast monoplane Hurricane and Spitfire fighters which became the mainstay of the Command. At the outbreak of war there were 35 fighter squadrons, but only 22 had the modern aircraft. By June 1940 Dowding had 48 squadrons – with more in the process of formation – equipped almost entirely with the latest models. The expansion in 1939–40 was aided greatly by mobilizing the Auxiliary Air Force (the air equivalent of the Territorial Army), which manned 14 squadrons during the battle, and by using the almost 5,000 men trained in the RAF Volunteer Reserve scheme (begun in April 1937 to train pilots in peacetime). The Reserve supplied almost one-third of the pilots who fought in the Battle of Britain. By the summer of 1940, poised to await the German assault, Fighter Command was one of the best-equipped and most efficient elements of Britain's armed forces.

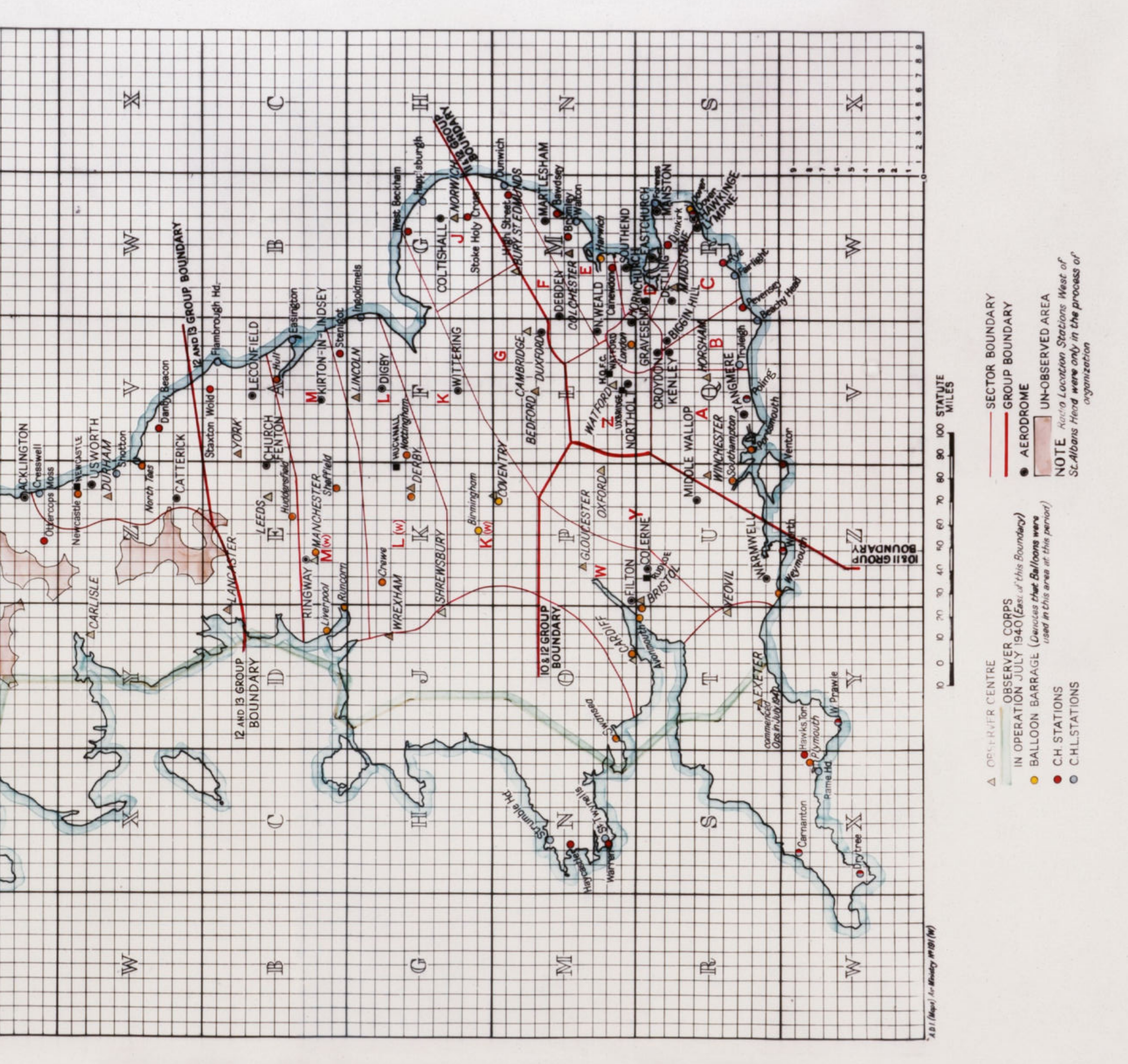
AIR COMMODORE ALFRED WARRINGTON-MORRIS (1883–1962)

Alfred Warrington-Morris was the second commandant of the Observer Corps attached to Fighter Command. He saw service throughout the Battle of Britain. Morris joined the Royal Navy in 1899, rising to the rank of commander in the Royal Naval Air Service during the First World War. In 1918 he joined the Royal Flying Corps and by 1919 became a wing commander in the RAF. He was an air commodore and commandant of the RAF Signals Branch at his retirement in 1934. He was then appointed deputy commandant of the new Observer Corps, and became its commandant in April 1936. He helped transfer the Corps to Fighter Command's control and was still commandant when the title "Royal" was added and the Corps became a uniformed part of the RAF in 1942. He finally retired from RAF duties in 1944.


APPENDIX "AA"
FIGHTER COMMAND LAYOUT
JULY 1940
SECRET
SHETLAND ISLANDS
Unst
Sumburgh
FOULA
FAIR ISLE
Fair Isle
ORKNEY ISLANDS
Nether Button
Thrumster
WICK
Hillhead
Rosehearty
School Hill
Doonies Hill
DYCE
ABERDEEN
St. Cyrus
MONTROSE
Douglas Wood
DUNDEE
Anstruther
DREM
Cockburnspath
Bamburgh
Drone Hill
Edinburgh
GALASHIELS
DUNFERMLINE
GRANGEMOUTH
TURNHOUSE
GLASGOW

FIGHTER HQ MAP

A map of the United Kingdom showing the disposition of air defences in July 1940. The map shows the sector and group boundaries, and details of radar, Observer Corps and Fighter Command stations.


12 AND 13 GROUP BOUNDARY
11 & 12 GROUP BOUNDARY
10 & 12 GROUP BOUNDARY
10 & 11 GROUP BOUNDARY
ACKLINGTON
USWORTH
CATTERICK
CHURCH FENTON
LECONFIELD
KIRTON-IN-LINDSEY
DIGBY
WITTERING
COLTISHALL
DEBDEN
DUXFORD
MARTLESHAM
N. WEALD
HORNCHURCH
NORTHOLT
KENLEY
BIGGIN HILL
TANGMERE
MIDDLE WALLOP
FILTON
COLERNE
EXETER
WARMWELL
RINGWAY
NORTH WEALD
SOUTHEND
MANSTON
HAWKINGE
LYMPNE
DETLING
CROYDON
GRAVESEND
EASTCHURCH
H.Q.F.C.
Stoke Holy Cross
West Beckham
Bawdsey
Dunkirk
Rye
Pevensey
Poling
Ventnor
Worth
Dry Tree
W. Prawle
Hawks Tor
OBSERVER CENTRE
OBSERVER CORPS IN OPERATION JULY 1940 (East of this Boundary)
BALLOON BARRAGE (Denotes that Balloons were used in this area at this period)
C.H. STATIONS
C.H.L. STATIONS
SECTOR BOUNDARY
GROUP BOUNDARY
AERODROME
UN-OBSERVED AREA
NOTE Radio Location Stations West of St. Albans Head were only in the process of organization
STATUTE MILES

BIRD-WILSON'S HURRICANE

On 24 September 1940, Squadron Leader Harold Bird-Wilson was shot down by the German ace Adolf Galland over the Thames. This is a photograph of the Hurricane he was flying.

"B" FLIGHT No 17 SQUADRON

THE LUFTWAFFE

1940

The German air force was reborn in March 1935 when Hitler formally announced that Germany was rearming in defiance of the Treaty of Versailles. The first German air force was abolished in 1919 when the terms of the Treaty denied Germany any military aircraft or an organized air force. During the 1920s, the German army kept abreast of current aviation developments and, following agreements in 1922 and 1926 with the Soviet Union, German pilots were given facilities at Soviet air bases to try out new aircraft. The Defence Ministry had an office of air affairs and when Hitler came to power in January 1933, it was hoped that this could form the nucleus for secret air rearmament.

Hitler's close political ally, Hermann Goering, former commander of the Richthofen squadron at the end of the Great War, was unwilling to allow the army to create a new air force. He was appointed Air Minister in Hitler's government, and undertook the task of reviving a military aviation industry and secretly recruiting and training a new generation of pilots.

Many of those who joined the secret air force had had experience in the numerous flying and gliding clubs set up in Germany in the 1920s. The key aircraft manufacturers – Ernst Heinkel, Willy Messerschmitt and Hugo Junkers – all had experience of developing high performance civil aircraft before 1933. After 1935 the air force expanded rapidly.

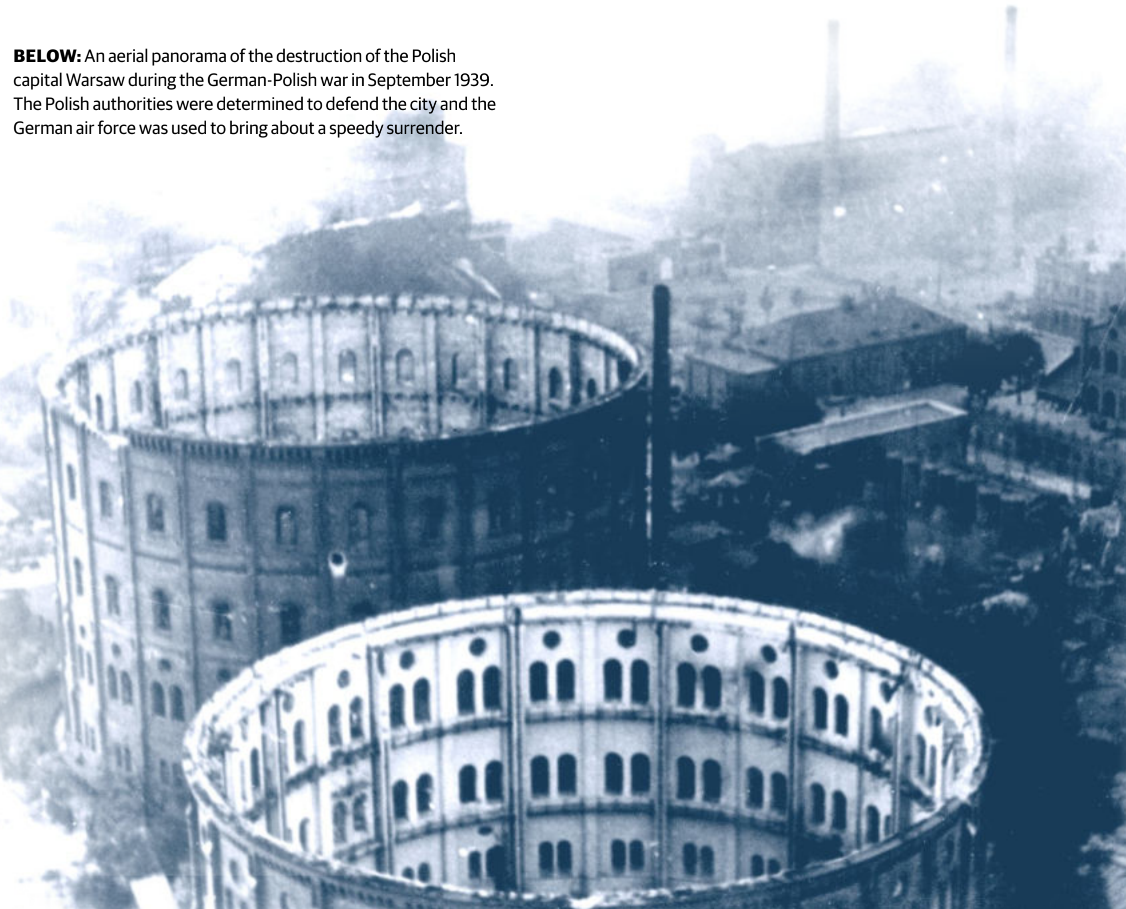
RIGHT: A German pilot and crew in the cockpit of a German bomber in September 1939. German air personnel were highly trained and their aircraft among the most technically sophisticated in the world at the time.

By 1939 there were around 600,000 personnel and a front-line strength, on the outbreak of war, of 3,609 high-quality aircraft. Goering became commander-in-chief of the new air force in 1935 and appointed other airmen he had known from the war years to high office. His deputy was the former Lufthansa director, Erhard Milch, who was the real driving-force behind the development of the force and its organization. The rapid expansion also relied on recruiting people with an army background, including the first chief of air staff Walther Wever and his successor, Albert Kesselring. The army officers brought with them a view of air power quite different from the British experience. The main emphasis in German air strategy was on co-operation between army and air force to give maximum hitting power to any ground assault. Fighters and dive-bombers were expected to attack and destroy the enemy air force while bombers attacked the enemy frontline and areas of supply. There was no plan for long-range independent bombing attacks, which were regarded as costly and of dubious strategic advantage. A long-range bomber, the Heinkel He 177, was under development in 1939, but it was not expected to be available in numbers until 1942–43.

The air force was organized into four air fleets, each one made up of a component of fighters, dive-bombers, bombers and reconnaissance aircraft. Within each air fleet there would be one or two air divisions, also composed of a mix of aircraft types. The object was to ensure that an air fleet could be assigned to particular army group areas to provide overall air support. The system worked very effectively in the campaign in Poland in 1939 and France in 1940, but it was not designed

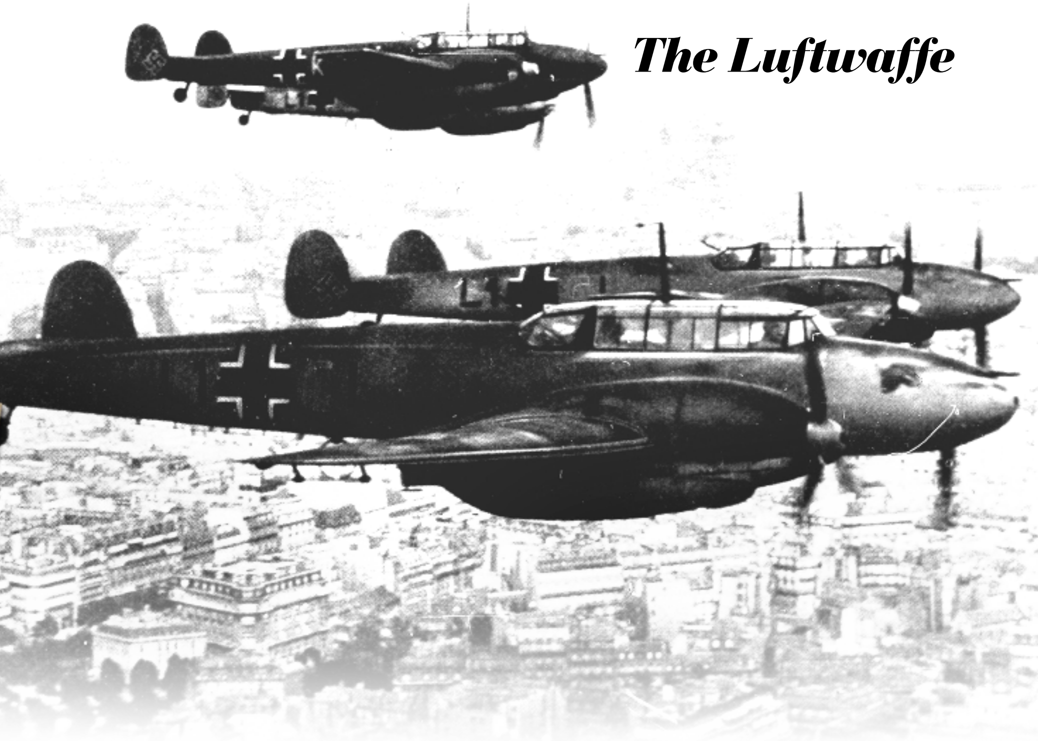
GENERAL HANS JESCHONNEK (1899–1943)

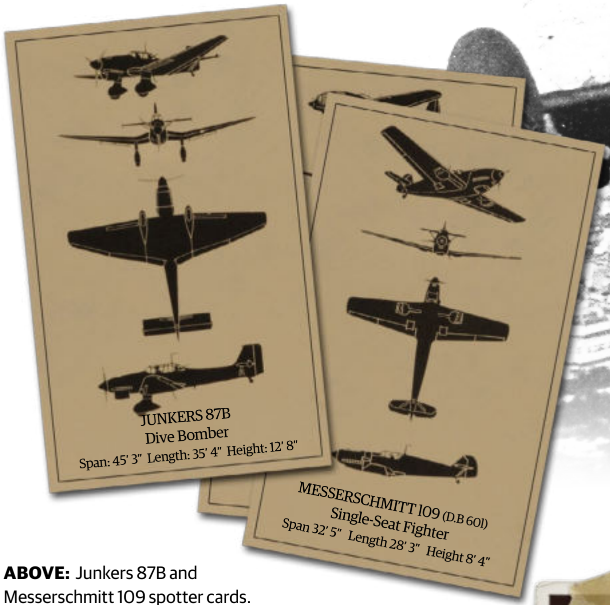
Hans Jeschonnek was appointed Chief of the German Air Force Staff by Hermann Goering on 1 February 1939 after a meteoric rise through the ranks of the fledgling German air force. He joined the German army aged 15 at the outbreak of the First World War and rose by 1917 to be a lieutenant, at which point he enrolled in the air service. He subsequently returned to army duties and joined the revived air force in September 1933 when it was still secret. He became operations chief in February 1938 and a year later chief of staff. He favoured tactical air power in support of the army, but argued in September 1940 for terror attacks against British cities to achieve a quick end to the war following failure in the Battle of Britain. Struggling later in the war to keep the Allied bombers at bay and subject to growing criticism, he committed suicide at Hitler's headquarters on 18 August 1943.



BELOW: An aerial panorama of the destruction of the Polish capital Warsaw during the German-Polish war in September 1939. The Polish authorities were determined to defend the city and the German air force was used to bring about a speedy surrender.

RIGHT: German twin-engined "destroyer" aircraft, Messerschmitt Me 110s, flying over Paris on 15 June 1940, two days before the French sought surrender. Paris was earlier declared an open city to avoid German air attacks, but Hitler had already been reluctant to order raids on Paris because of its architectural beauty.




JUNKERS 87B
Dive Bomber
Span: 45' 3" Length: 35' 4" Height: 12' 8"
MESSERSCHMITT 109 (D.B 601)
Single-Seat Fighter
Span 32' 5" Length 28' 3" Height 8' 4"

ABOVE: Junkers 87B and Messerschmitt 109 spotter cards.

BELOW: A long line of Messerschmitt Me 109 fighter aircraft under construction in a factory in 1943. The fighter was the mainstay of the German fighter force but was produced in quantities too small for what was needed in 1940. Mass production and rationalization only began to make an impact on German aircraft output later in the war.

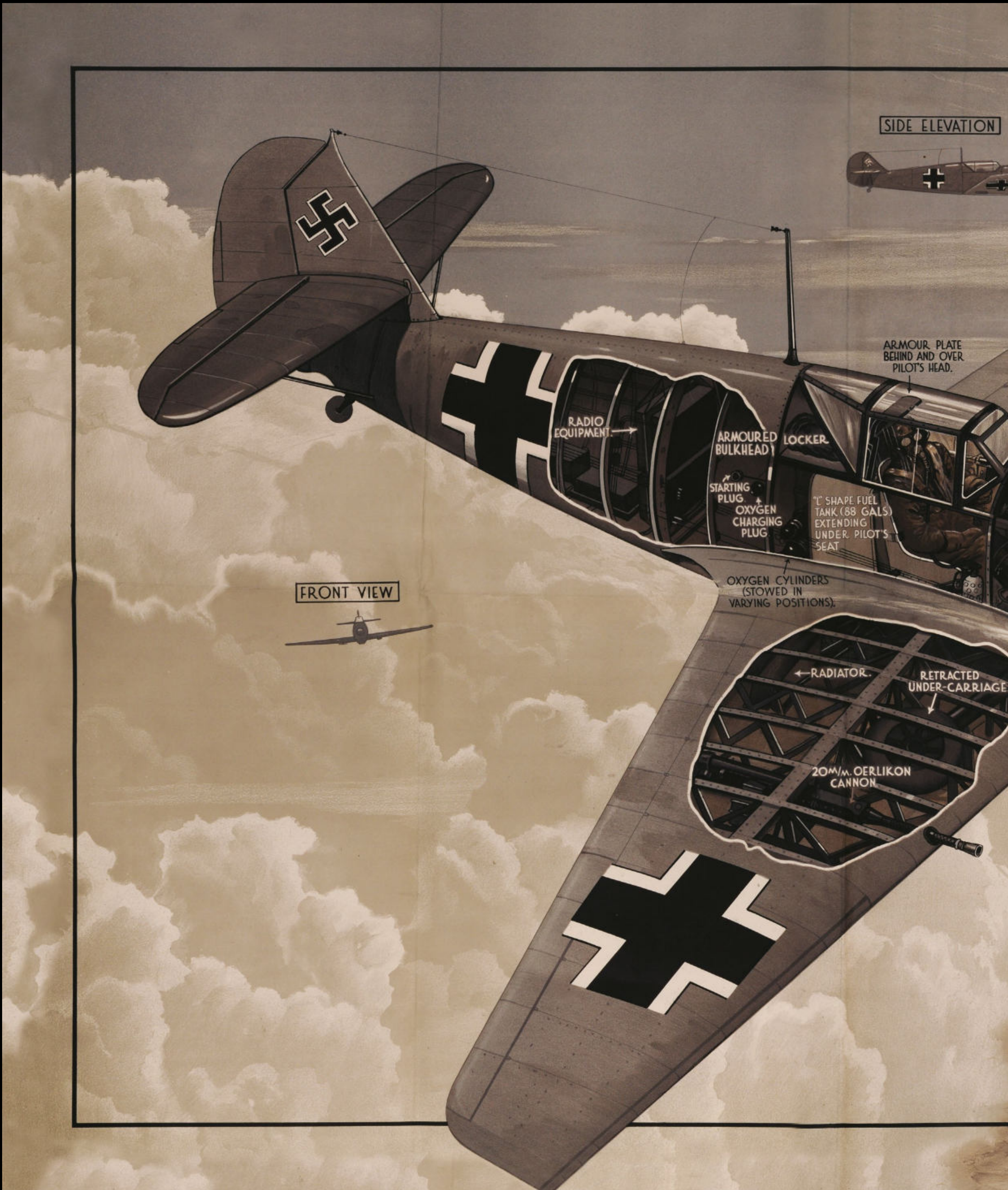
to undertake an independent air campaign as would be required in the Battle of Britain. The medium bombers carried small bomb loads and had limited range; the fighters were only able to penetrate into a limited area of southern England, even from the bases captured in France and the Low Countries.

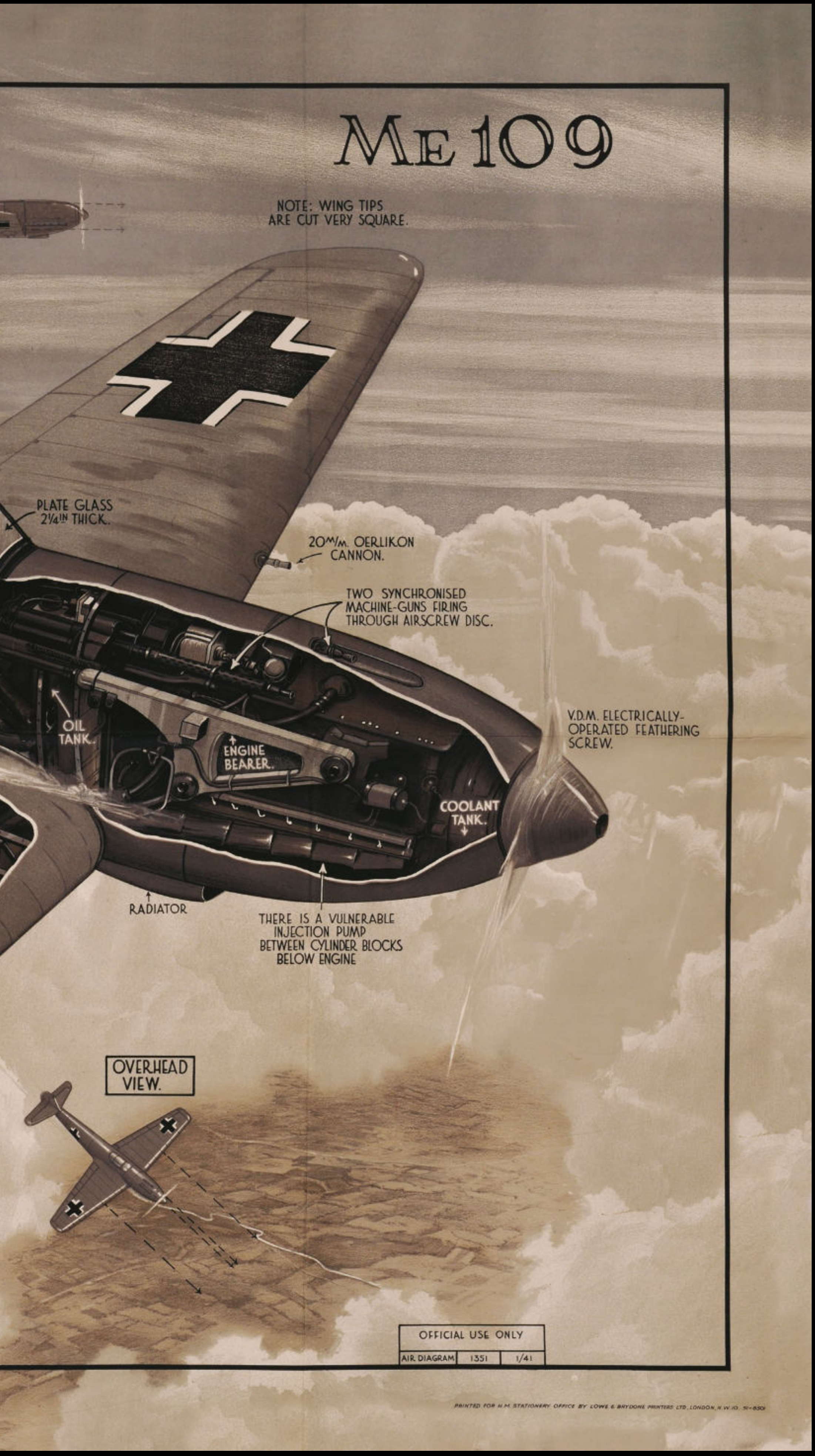
Little provision was made in the new German air force for the air defence of Germany, much of which was left to anti-aircraft artillery. Although German scientists had developed radar as well, there was no comprehensive system of air defence based on radar and independent fighter units. For this reason it proved difficult for German commanders to grasp the nature of the system they confronted in Britain in the summer of 1940. The German air force was compelled to adapt to an operation for which it had not been well prepared against an enemy who had anticipated well in advance the kind of campaign to expect.

WILLY MESSERSCHMITT (1898–1978)

Messerschmitt was the most famous German aircraft designer of his generation, responsible for the standard German air force fighter, the Me 109, and the development of the first successful jet aircraft, the Me 262. The son of a wine merchant, Messerschmitt showed an early fascination with the novelty of aircraft design. In 1917, he served briefly in the German army, before studying engineering in Munich. It was during his studies that he founded the Messerschmitt Aircraft Construction Company in Bamberg. Later on, he also worked closely with the Bavarian Aircraft Works (founded in 1927), and the two companies eventually merged. This explains the prefix Bf (Bayerische Flugzeugwerke) originally attached to the 109 series fighter. He joined the National Socialist Party in 1933 and supported policies including the use of concentration camp labour to build his aircraft. He was banned from working on aircraft after his denazification hearing, but in 1955 was again designing aircraft for the German air force.

BELOW: A Heinkel He 111 bomber under camouflage at Marquise near Calais in August 1940 during the Battle of Britain. German bases were close to British bombers, and aircraft had to be dispersed and concealed to avoid destruction on the ground.


SIDE ELEVATION
ARMOUR PLATE BEHIND AND OVER PILOT'S HEAD.
RADIO EQUIPMENT.
ARMOURED BULKHEAD
LOCKER
STARTING PLUG
OXYGEN CHARGING PLUG
"L" SHAPE FUEL TANK (88 GALS) EXTENDING UNDER PILOT'S SEAT
OXYGEN CYLINDERS (STOWED IN VARYING POSITIONS).
FRONT VIEW
RADIATOR.
RETRACTED UNDER-CARRIAGE
20M/M. OERLIKON CANNON.


ME 109
NOTE: WING TIPS ARE CUT VERY SQUARE.
PLATE GLASS 2¼IN THICK.
20M/M. OERLIKON CANNON.
TWO SYNCHRONISED MACHINE-GUNS FIRING THROUGH AIRSCREW DISC.
OIL TANK.
ENGINE BEARER.
V.D.M. ELECTRICALLY-OPERATED FEATHERING SCREW.
COOLANT TANK.
RADIATOR
THERE IS A VULNERABLE INJECTION PUMP BETWEEN CYLINDER BLOCKS BELOW ENGINE
OVERHEAD VIEW.
OFFICIAL USE ONLY
AIR DIAGRAM
1351
1/41
PRINTED FOR H.M. STATIONERY OFFICE BY LOWE & BRYDONE PRINTERS LTD, LONDON, N.W.10. 51-6501

MESSERSCHMITT DIAGRAM

A poster showing the cutaway interior of the Messerschmitt Me 109 (originally designated the Bf 109) single-seat fighter, the mainstay of the German fighter force in 1940.

DOWDING VERSUS GOERING

There was a striking contrast between the two commanders who faced each other for the Battle of Britain in the summer of 1940. Hugh Dowding was effectively commander of the defensive battle, although he was also responsible to the chief of the air staff, Air Chief Marshal Sir Cyril Newall and, from October 1940, (acting) Air Chief Marshal Sir Charles Portal. Hermann Goering, promoted to Reich Marshal by Hitler in July 1940 as a reward for the success of the air force in the conquest of France, was the German commander-in-chief for the air campaign against Britain. Dowding was a man of 58 with a long and distinguished career behind him. As a commander he was older than was usual and had been due to retire in 1939.

ABOVE: Dowding inspects a passing out parade of aircraft apprentices at the Halton School of Technical Training on 19 December 1933. Dowding was the Air Member for Supply and Research at the time, with a strong interest in the technical development of the force.

His replacement suffered an accident and Dowding was kept in post. Twice more in 1940 – once in March and again in July – he was told he must retire, but at Churchill's insistence was kept on as commander until November, when the battle was effectively over. Dowding was born in Scotland, the son of a schoolmaster, joined the army in 1899 and served in India and the Far East. He was a keen sportsman and skier, and learned to fly before the First World War. He joined the Royal Flying Corps in 1914, but was posted to organize training in 1916. He was retained in the post-war RAF and became director of training in 1926. In 1930, he became responsible for supply and research in the Air Ministry and it was in this capacity that he oversaw the introduction of radar and the development of modern fighter aircraft. In July 1936, he took over as chief of the newly created Fighter Command.

Dowding had a solid reputation as a talented organizer and commander, but his personality was reserved and awkward. He could talk at length about his interests but did not tolerate contradiction or incompetence. He proved to be a single-minded defender of the fighter force against all attempts to divert fighters to functions other than the defence of the United Kingdom. He brought to his command a great deal of technical and tactical experience and understood the many problems faced by pilots in trying to intervene effectively against incoming bombers. His judgement about the possibility of effective defence, and his strenuous efforts to strengthen his force and reorganize its operational practice were vital elements in the outcome of the Battle of Britain.

SIR ARCHIBALD SINCLAIR (1890–1970)

Goering's direct opposite on the British side was the air minister, Archibald Sinclair. But unlike the German system, the air minister was not simultaneously the commander-in-chief of the air force. Sinclair began an army career in the Life Guards, and served in France throughout the First World War. He became Churchill's secretary at the War Office between 1919 and 1921. In 1922, he began a political career as Liberal MP for Caithness and Sutherland, a constituency he represented until 1945. In 1940, he was appointed air minister by Churchill and became an enthusiast for the strategic bombing of Germany, a policy that he defended against all criticism in parliament. He was defeated in the 1945 election, and was created Viscount Thurso in 1952, acting as leader of the Liberal Party in the House of Lords. He retired from public life in 1964.

Hermann Goering was, like Dowding, a young army officer before 1914 who became fascinated

BELOW: Hermann Goering with air force officers on one of his visits to the French front during the Battle of Britain. To his left is the German fighter commander Adolf Galland.

GENERAL ERNST UDET (1896-1941)

A well known air ace from the First World War, Ernst Udet flew with the famous Richthofen squadron under the command of Hermann Goering. In the 1920s, he became a popular air stuntman and film star until he was recruited by Goering to join the German air force. He joined the National Socialist Party and in 1936 became head of the air force Technical Office where he advocated dive-bombing as the most effective form of bomb attack. In 1939, he was created General Quartermaster of the Air Force in charge of all procurement and technical development. A bon viveur and womanizer, Udet was completely inadequate for his job. When it was evident that German aircraft production and development had stagnated due to his failures, he committed suicide in November 1941 and was given a state funeral.

ABOVE: Hermann Goering and the head of the air force technical office, Ernst Udet, watch air manoeuvres on the German Pomeranian coast in the late 1930s. Although unschooled in either strategy or aviation technology, Goering took a very active part in shaping the German air force in the 1930s.

by flying. He was posted to the new German air force and on the death of von Richthofen, the famous "red baron", he became commander of the squadron. After the war, he became a commercial traveller who flew occasional air show stunts. In 1922 he met Adolf Hitler and his future was transformed. He commanded the Stormtroopers (SA) in 1923 at the time of Hitler's failed coup in Bavaria and was forced to flee abroad. He returned in 1927 and threw himself into politics. He became one of the first National Socialist parliamentary deputies and by 1932 was president of the German parliament. In 1933, he entered the Hitler cabinet and remained a minister until 1945. In 1935, he was appointed commander-in-chief of the German air force, a post he held until almost the end of the war, when Hitler stripped him of office in the belief that Goering was trying to supplant him.

Unlike Dowding, Goering had no administrative or command experience. He was a gaudy, ambitious and ruthless individual who used his many offices to create a sumptuous, almost regal lifestyle. He relied on others to undertake much of the routine work of high office, but was always quick to take the credit for their achievements. He was neither stupid nor entirely indolent, but he lacked the capacity to make serious technical decisions and, despite his jealous guardianship of the air force, was unable to prevent it being used largely in support of Germany's powerful and influential army. He contributed little to the air battles of 1940 except to bully and exhort his subordinates. In 1940, he was given the opportunity to show what the air force could achieve on its own in the Battle of Britain. Its eventual failure to subdue the RAF began the slow erosion of Hitler's confidence in Goering's capacity to deliver what he promised.

LEFT: After the war Goering was captured and put on trial at Nuremberg for a range of war crimes. He sits on the far left, second row in this courtroom photograph taken during the trial.

BELOW: King George VI and Queen Elizabeth visit Dowding at Bentley Priory in September 1940. She later complained that Dowding never stopped talking. He could seem reserved, but on issues which interested him was notoriously voluble.

HITLER TURNS TO BRITAIN

The situation facing Adolf Hitler in the summer of 1940 was quite unexpected and left him uncertain as to his next moves. When German forces launched their attack on the Western states on 10 May 1940, there was no certainty that a quick victory would be the result. Yet so effective was the German battle plan, Operation Sickle Cut, that the combined forces of the Netherlands, Belgium, France and Britain were unable to prevent a swift and comprehensive defeat. The Dutch army surrendered on 14 May, and the Belgian army on 28 May. The British Expeditionary Force was forced to retreat back to Britain from Dunkirk, undefeated but without its equipment. On 17 June, France sued for an armistice and the war on Continental Europe ended after just six weeks of fighting.

German leaders thought that with the French defeated, Britain would now sue for peace since there no longer seemed any sense in continuing the war. On 23 June, Hitler's Propaganda Minister, Joseph Goebbels, told his staff, "We are very close to the end of the war." Hitler informed the army chief of staff that he regarded an invasion as "very hazardous", and he expected that political and diplomatic pressure would bring Britain to the conference table. Nevertheless, the German armed forces had already begun to plan for possible action against England. The German navy had been preparing contingency plans for an invasion since November 1939, and in May and June the navy's commander-in-chief, Grand Admiral Erich Raeder, suggested to Hitler the possibility of just such an operation. Later in June, the German army also began preliminary research into an invasion of southern England. Not until 7 July did Hitler order the armed forces to prepare definite plans for the continuation of the war against Britain and only on 16 July did he sign War Directive 16 for "Operation Sealion", the codename for an invasion.

Hitler still counted on Britain seeking a political solution. Various hints from British sources suggested that a peaceful settlement might be possible and on 19 July in a session of the German parliament, Hitler gave a speech designed to open the way for a possible negotiated settlement. He said he had no desire to destroy the British Empire and was prepared to consider terms, albeit "as a conqueror". The British government rejected the proposal formally on 22 July, since Churchill and his cabinet had no reason to trust German good faith. On 23 July, Goebbels told a press conference, "Gentlemen, there will be war!" Plans were set in motion to mount a seaborne invasion of the southern English counties of Kent and Sussex with 13 divisions of 260,000 men. There were strong doubts expressed through July about its feasibility, from Hitler downwards. It was evident that only the elimination of the RAF and the bombing of British military targets would create conditions to give an invasion any chance of success. The preliminary destruction of British air power, and a combined air and naval assault on British shipping and ports were authorized as the first stage of Germany's Battle of Britain.

There has been much speculation about whether Hitler was ever serious about invading Britain. At

BELOW: The French destroyer Bourrasque sinking off the French port of Dunkirk laden with troops during the Dunkirk evacuation in late May and early June 1940. The loss of almost all British equipment in France persuaded Hitler that an invasion of England might be possible.

ABOVE: A cavalcade of cars on its way to the German Reich Chancellery during the victory parade for the defeat of France on 6 July 1940. The victory opened the way to German domination of Continental Europe.

ADOLF HITLER (1889-1945)

Adolf Hitler was born in Braunau am Inn, Austria, the son of a customs official. He had ambitions to become an architect, but lacked sufficient talent. In 1914, he volunteered for service in the German army and became a "runner" between the lines, decorated twice for bravery. In 1919, he joined a small radical nationalist party, the German Workers' Party, and by 1921 had become its leader under the changed title of National Socialist German Workers' Party. He staged a failed coup d'état in 1923 and was briefly imprisoned. He campaigned against the Versailles Treaty and demanded a national revival and German "living space". On becoming ruler of Germany in 1933, he launched large-scale rearmament. By 1938, when he became the armed forces' supreme commander, he had formed plans for German expansion in Eastern Europe. In 1939, he attacked Poland in the belief that Britain and France would back down. During the world war that resulted he tried to conquer most of Europe and Western Asia in order to establish a German empire. He also authorized the mass killing of Europe's Jews. In 1945, with Allied armies closing on Berlin, he committed suicide in his underground bunker.

SS INFORMATION HANDBOOK GB

In the summer of 1940, the SS officer Walter Schellenberg, responsible for counter-espionage in Office IVE of the Gestapo organization, helped make a comprehensive guide for the SS and secret policemen who would be trying to make Britain a secure part of Hitler's empire after the success of Operation Sealion. The handbook covered the main areas of public life, including the masons, the churches and the British intelligence services. Appended to the survey was a list of those who might be subject to arrest and imprisonment once the Germans had arrived. An SS colonel Dr Franz Six, later tried for war crimes, was to have been the commander of the Einsatzkommandos (Action Commands) carrying out the arrests. The list included both Neville Chamberlain and Winston Churchill, and the distinguished philosopher Bertrand Russell. Some 20,000 copies of the handbook were made, but were destroyed in Berlin during a bombing raid in 1943.

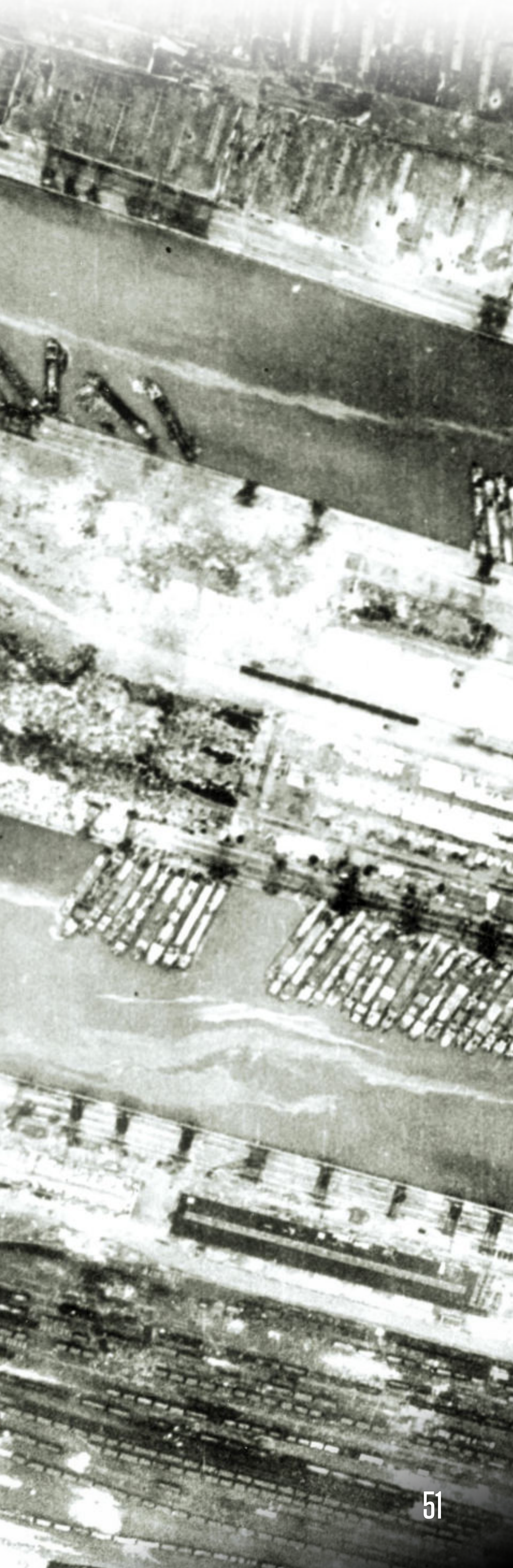
ABOVE: Heinrich Himmler, head of the SS.

the same time as Operation Sealion was being prepared, preliminary discussions began between Hitler and his military staff about a possible blow against the Soviet Union. On 31 July, Hitler announced for the first time the possibility of an invasion in the east as a means of removing any prospect Britain might have of continuing the war by relying on Soviet assistance. There is, nonetheless, little doubt that Hitler looked for a possible cheap victory in the West as long as the RAF could be eliminated and Britain, as a result, frightened into submission. "If results of air warfare are unsatisfactory," he also announced on 31 July, "invasion preparations will be stopped." The defeat of the RAF thus became the central aim of German strategy, without which a more ambitious campaign against Britain could not be mounted with any serious chance of success.

ABOVE: Native troops man Italian artillery in Egypt on 13 October 1940. Italy's North African army crossed into Egypt in September to put additional pressure on Britain at the height of the invasion scare.

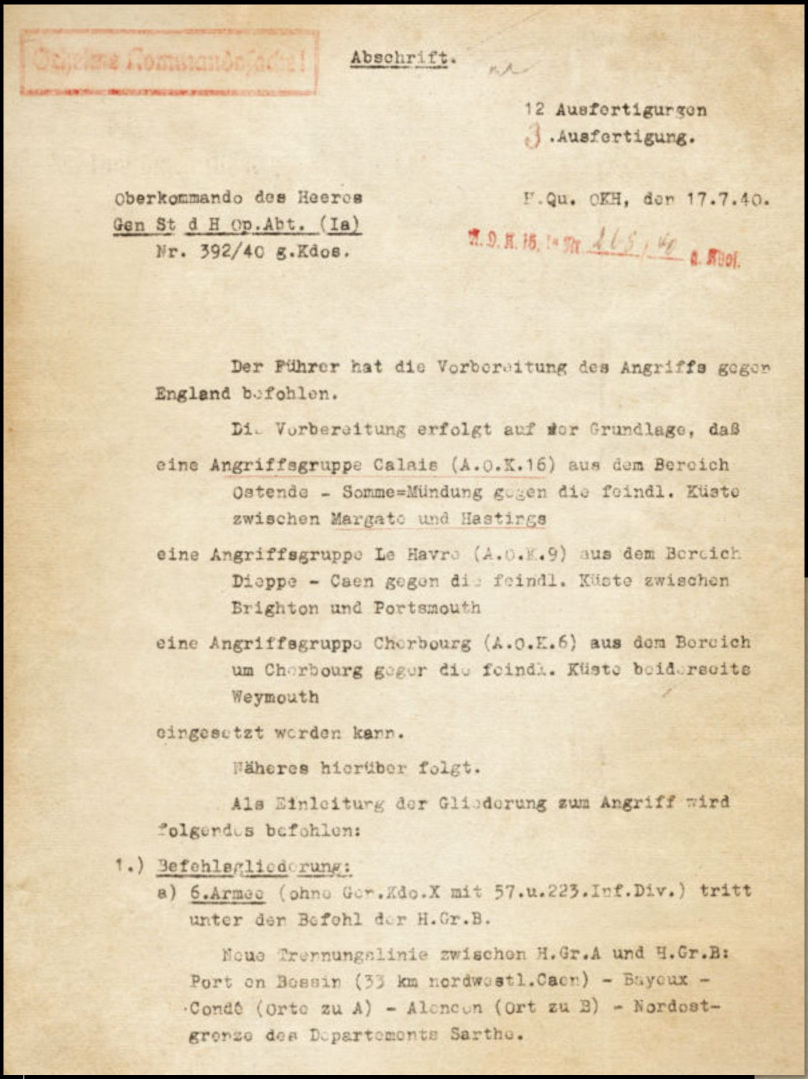
BELOW: Hitler addresses the German parliament in the Kroll Opera House in Berlin on 19 July 1940 in order to make a "peace offer" to Britain. Behind Hitler sits Hermann Goering, who was also president of the Reichstag.

BELOW: An aerial reconnaissance photograph of barges collected by German forces in the harbour at Dunkirk ready for the planned invasion of southern England in mid-September 1940. The barges were attacked regularly by aircraft of RAF Bomber Command throughout the period of German build-up.



GERMAN ARMY ORDERS

Operational order to the chiefs-of-staff of the German army from General Halder on 17 July 1940, ordering them to prepare for the invasion of England in Operation "Sealion".



Geheime Kommandosache!

Abschrift.

12 Ausfertigungen
3 .Ausfertigung.

Oberkommando des Heeres
Gen St d H Op.Abt. (Ia)
Nr. 392/40 g.Kdos.

H.Qu. OKH, den 17.7.40.

A.O.K.16, Ia Nr. 265/40 g. Kdos.

Der Führer hat die Vorbereitung des Angriffs gegen England befohlen.

Die Vorbereitung erfolgt auf der Grundlage, daß

eine Angriffsgruppe Calais (A.O.K.16) aus dem Bereich Ostende - Somme=Mündung gegen die feindl. Küste zwischen Margate und Hastings

eine Angriffsgruppe Le Havre (A.O.K.9) aus dem Bereich Dieppe - Caen gegen die feindl. Küste zwischen Brighton und Portsmouth

eine Angriffsgruppe Cherbourg (A.O.K.6) aus dem Bereich um Cherbourg gegen die feindl. Küste beiderseits Weymouth

eingesetzt werden kann.

Näheres hierüber folgt.

Als Einleitung der Gliederung zum Angriff wird folgendes befohlen:

1.) Befehlsgliederung:

a) 6.Armee (ohne Gen.Kdo.X mit 57.u.223.Inf.Div.) tritt unter den Befehl der H.Gr.B.

Neue Trennungslinie zwischen H.Gr.A und H.Gr.B: Port en Bessin (33 km nordwestl.Caen) - Bayeux - Condé (Orte zu A) - Alencon (Ort zu B) - Nordostgrenze des Departements Sarthe.

TRANSLATION

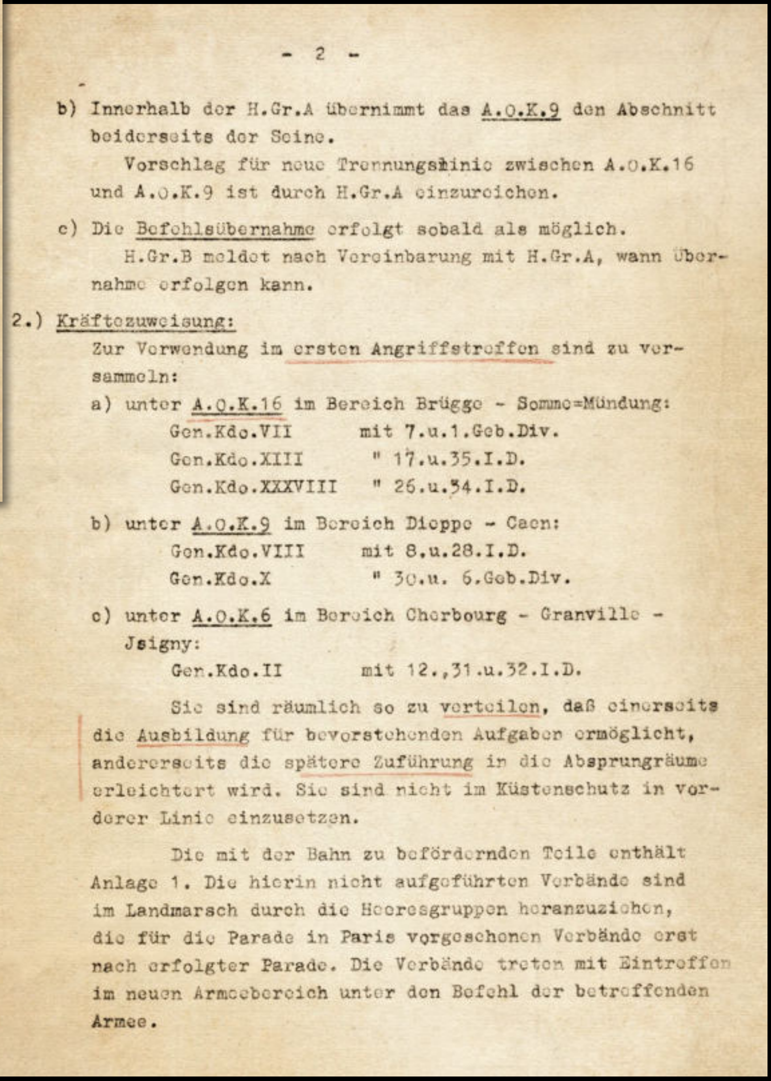
The Führer has ordered preparations for the attack on England.

The preparations will take place on the principle:

That one Calais (A.O.K. 16) attack wing is deployed from the Ostend–mouth of the Somme area against the enemy coast between Margate and Hastings.

One Le Havre (A.O.K. 9) attack wing is deployed from the Dieppe–Caen area against the enemy coast between Brighton and Portsmouth.

One Cherbourg (A.O.K. 6) attack wing is deployed from the area around Cherbourg against the enemy coast, both sides of Weymouth.



- 2 -

b) Innerhalb der H.Gr.A übernimmt das A.O.K.9 den Abschnitt beiderseits der Seine.

Vorschlag für neue Trennungslinie zwischen A.O.K.16 und A.O.K.9 ist durch H.Gr.A einzureichen.

c) Die Befehlsübernahme erfolgt sobald als möglich.

H.Gr.B meldet nach Vereinbarung mit H.Gr.A, wann Übernahme erfolgen kann.

2.) Kräftezuweisung:

Zur Verwendung im ersten Angriffstreffen sind zu versammeln:

a) unter A.O.K.16 im Bereich Brügge - Somme=Mündung:
Gen.Kdo.VII mit 7.u.1.Geb.Div.
Gen.Kdo.XIII " 17.u.35.I.D.
Gen.Kdo.XXXVIII " 26.u.34.I.D.

b) unter A.O.K.9 im Bereich Dieppe - Caen:
Gen.Kdo.VIII mit 8.u.28.I.D.
Gen.Kdo.X " 30.u. 6.Geb.Div.

c) unter A.O.K.6 im Bereich Cherbourg - Granville - Jsigny:
Gen.Kdo.II mit 12.,31.u.32.I.D.

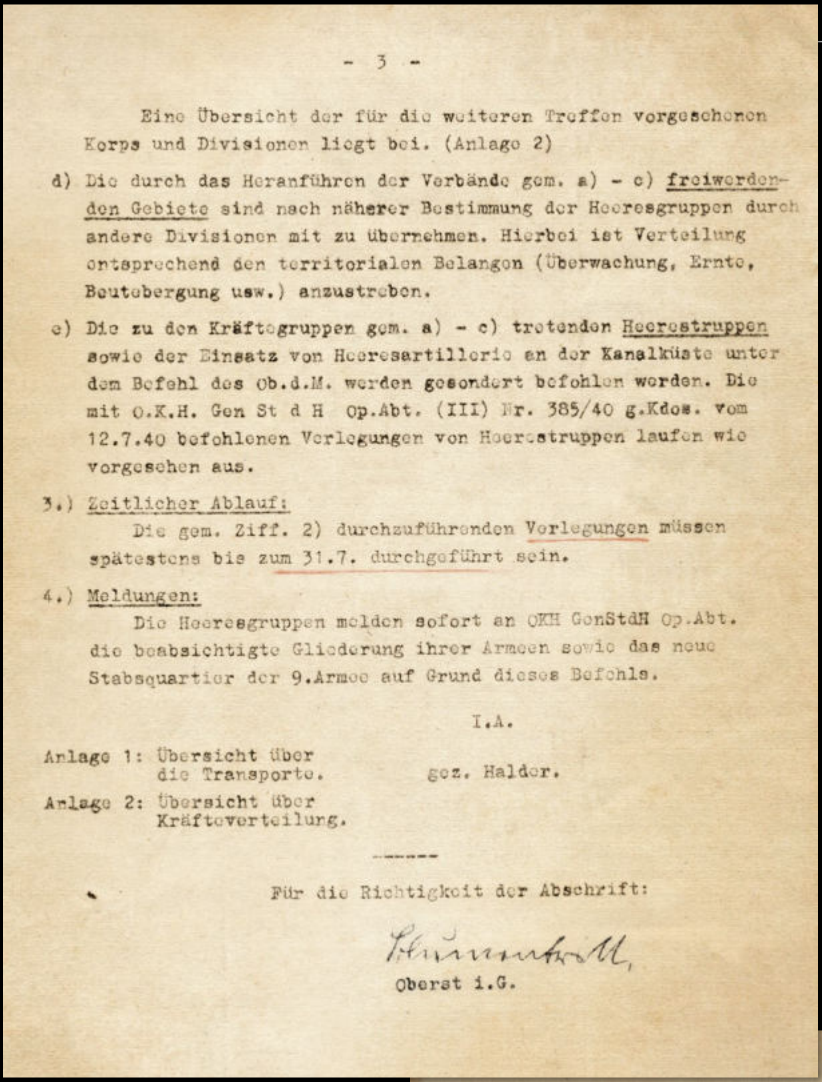
Sie sind räumlich so zu verteilen, daß einerseits die Ausbildung für bevorstehenden Aufgaben ermöglicht, andererseits die spätere Zuführung in die Absprungräume erleichtert wird. Sie sind nicht im Küstenschutz in vorderer Linie einzusetzen.

Die mit der Bahn zu befördernden Teile enthält Anlage 1. Die hierin nicht aufgeführten Verbände sind im Landmarsch durch die Heeresgruppen heranzuziehen, die für die Parade in Paris vorgesehenen Verbände erst nach erfolgter Parade. Die Verbände treten mit Eintreffen im neuen Armeebereich unter den Befehl der betreffenden Armee.

TRANSLATION

B) Within Army Group A, A.O.K. 9 takes over the section on both sides of the Seine. Proposal for a new dividing line between A.O.K. 16 and A.O.K. 9 is to be submitted by Army Group A.

C) Take-over of command is to take place as soon as possible. Army Group B shall report after agreement with Army Group A, when take-over can take place.



- 3 -

Eine Übersicht der für die weiteren Treffen vorgesehenen Korps und Divisionen liegt bei. (Anlage 2)

d) Die durch das Heranführen der Verbände gem. a) - c) freiwerdenden Gebiete sind nach näherer Bestimmung der Heeresgruppen durch andere Divisionen mit zu übernehmen. Hierbei ist Verteilung entsprechend den territorialen Belangen (Überwachung, Ernte, Beutebergung usw.) anzustreben.

e) Die zu den Kräftegruppen gem. a) - c) tretenden Heerestruppen sowie der Einsatz von Heeresartillerie an der Kanalküste unter dem Befehl des Ob.d.M. werden gesondert befohlen werden. Die mit O.K.H. Gen St d H Op.Abt. (III) Nr. 385/40 g.Kdos. vom 12.7.40 befohlenen Verlegungen von Heerestruppen laufen wie vorgesehen aus.

3.) Zeitlicher Ablauf:

Die gem. Ziff. 2) durchzuführenden Verlegungen müssen spätestens bis zum 31.7. durchgeführt sein.

4.) Meldungen:

Die Heeresgruppen melden sofort an OKH GenStdH Op.Abt. die beabsichtigte Gliederung ihrer Armeen sowie das neue Stabsquartier der 9.Armee auf Grund dieses Befehls.

I.A.

gez. Halder.

Anlage 1: Übersicht über die Transporte.
Anlage 2: Übersicht über Kräfteverteilung.

Für die Richtigkeit der Abschrift:

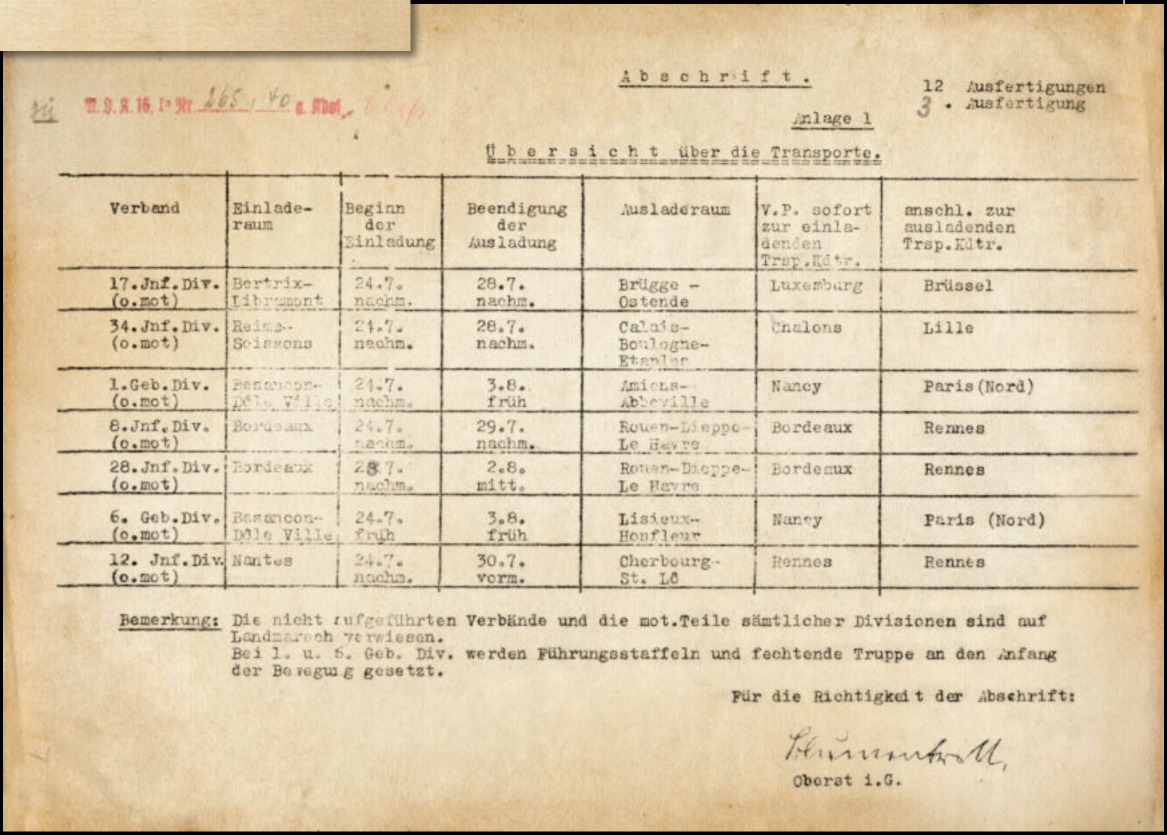
Oberst i.G.

TRANSLATION

The units designated for the parade in Paris will not be transferred until after the parade. The units will fall under the command of the appropriate army once they arrive at their new army section.

SUMMARY OF TRANSPORT

This document gives an overview of the transport for the army. It lists the transport unit, where and at what time loading should begin and end, where they should unload and where higher staff should join to immediately load.



T.D.R.16, Ia Nr. 265/40 g.Kdos.

Abschrift.

12 Ausfertigungen
3. Ausfertigung

Anlage 1

Übersicht über die Transporte.

Verband	Einlade-raum	Beginn der Einladung	Beendigung der Ausladung	Ausladeraum	V.P. sofort zur einladenden Trsp.Kdtr.	anschl. zur ausladenden Trsp.Kdtr.
17.Jnf.Div. (o.mot)	Bertrix-Libramont	24.7. nachm.	28.7. nachm.	Brügge - Ostende	Luxemburg	Brüssel
34.Jnf.Div. (o.mot)	Reims-Soissons	24.7. nachm.	28.7. nachm.	Calais-Boulogne-Etaples	Chalons	Lille
1.Geb.Div. (o.mot)	Besancon-Dôle Ville	24.7. nachm.	3.8. früh	Amiens-Abbeville	Nancy	Paris (Nord)
8.Jnf.Div. (o.mot)	Bordeaux	24.7. nachm.	29.7. nachm.	Rouen-Dieppe-Le Havre	Bordeaux	Rennes
28.Jnf.Div. (o.mot)	Bordeaux	28.7. nachm.	2.8. mitt.	Rouen-Dieppe-Le Havre	Bordeaux	Rennes
6. Geb.Div. (o.mot)	Besancon-Dôle Ville	24.7. früh	3.8. früh	Lisieux-Honfleur	Nancy	Paris (Nord)
12. Jnf.Div. (o.mot)	Nantes	24.7. nachm.	30.7. vorm.	Cherbourg-St. Lô	Rennes	Rennes

Bemerkung: Die nicht aufgeführten Verbände und die mot.Teile sämtlicher Divisionen sind auf Landmarsch verwiesen.
Bei 1. u. 6. Geb. Div. werden Führungsstaffeln und fechtende Truppe an den Anfang der Bewegung gesetzt.

Für die Richtigkeit der Abschrift:

Oberst i.G.

THE BATTLE BEGINS

Even before any decision had been taken to undertake an invasion of Britain, German air and naval forces had already begun operations against British trade and shipping. The German navy's commander-in-chief, Grand Admiral Raeder, favoured a blockade of British trade by sea and air attacks which would cripple Britain's capacity to supply its armed forces and feed the population. The idea of blockading Britain was approved by Hitler and it remained an important element in German strategy throughout the period of the Battle of Britain and the subsequent Blitz. Between June 1940 and the end of the year, more than three million tons of merchant shipping was sunk, of which around 350,000 tons was accounted for by air attack. The quantity of goods imported into Britain fell by one-fifth during the period.

During June and July, the German air force, operating from its new bases spread across northern France and the Low Countries, began a series of probing attacks against targets in southern England to test the defences there and to help in developing effective tactics for attack. Since the German side had not expected to wage a war of this kind, the preparatory attacks were useful in giving pilots experience of what to expect when the full air battle was joined. They attacked in small formations, but the targets selected were so random that British commanders could make little sense of them. One attack on 31 July left bombs scattered from eastern Cornwall to Monmouth, on the Welsh border, most of which fell in open country or on small villages and towns. By the end of July, 258 civilians had been killed but only limited damage done to military facilities. The early attacks also gave Fighter Command the opportunity to refine its operations and discuss tactics. The protective fighter belt was spread further to the west with the creation of 10 Group and some additional radar stations were built. Both sides waited for the real battle to begin.

German air commanders only finalized the operational plans for the elimination of the RAF late in July 1940. On 1 August, Hitler issued a directive calling on the German air force "to overpower the English air force … in the shortest possible time". The German side was confident that the RAF could be defeated quickly. The army chief of staff, General Franz Halder, was told that the operation to secure air superiority would take at most between two weeks and a month.

German air intelligence assumed that the RAF was already weakened by the battle in France and estimated British aircraft production at only half its true figure. The difficulty faced by the German air force was the uncertainty about whether an invasion would actually take place and the wide range of different targets they were ordered to

ABOVE: Life in an English country pub continues almost as normal following a bombing raid in July 1940. Small hit-and-run raids were carried out all through the summer as the German air force probed the defences and refined their tactics.

GRAND ADMIRAL ERICH RAEDER (1876–1960)

Erich Raeder was commander-in-chief of the German navy at the start of the Second World War, a post he had held since 1928. Born in the port city of Hamburg, Raeder joined the navy in 1894 and rose rapidly through the ranks. He was not an enthusiast for Hitler, but recognized that in the Third Reich he could fulfil his dream of rebuilding a powerful German navy. He realized how weak his force was in 1939 when faced with the British and French fleets, but hoped that a successful sea-air blockade might force Britain out of the war. After a series of naval disasters, he was finally relieved of office in 1943. He was tried at the Nuremberg trials in 1945–46 and sentenced to life imprisonment, but served only nine years before his release.

RIGHT: The German long-range reconnaissance and bomber aircraft Focke-Wulf 200. Known as the "Condor", the aircraft played an important early role in the war against British shipping but was vulnerable to faster-flying fighter aircraft.

attack. On 2 August, Goering ordered what he called “Eagle Attack” against RAF bases, ports, factories and units of the Royal Navy; the following day the air force chief of staff, Hans Jeschonnek, additionally ordered attacks on radar stations. The actual start of the campaign – known as “Eagle Day” – had to be postponed in early August because of bad weather and the slow recovery from the heavy losses inflicted in the battle of France. In the end, Eagle Day was launched only on 13 August.

The two air forces that faced each other for the battle in August 1940 were more evenly matched than the popular view of the battle suggests. By 9 August, Fighter Command had 1,032 fighter aircraft with a further 424 in reserve for immediate use. The German single-engine fighter force on 10 August numbered 1,011. Fighter Command had on average 1,400 fighter pilots available during the weeks of August, the German fighter force only 1,100–1,200, with 800–900 regularly available for operations. In addition the German Air Fleets 2 and 3 in northern France and the Low Countries, and Air Fleet 5 in Norway, mustered around 250 twin-engined fighters, 280 dive-bombers and 1,000 serviceable bombers. British Bomber Command had around 500 bombers by August. These were the forces that fought out the Battle of Britain when the German onslaught was finally launched.

ABOVE: The Welsh port of Swansea at dawn after a third night of bombing in August 1940. German aircraft attacked port cities as part of a broad plan to blockade Britain into surrender and to disrupt the British war economy.

COASTAL COMMAND

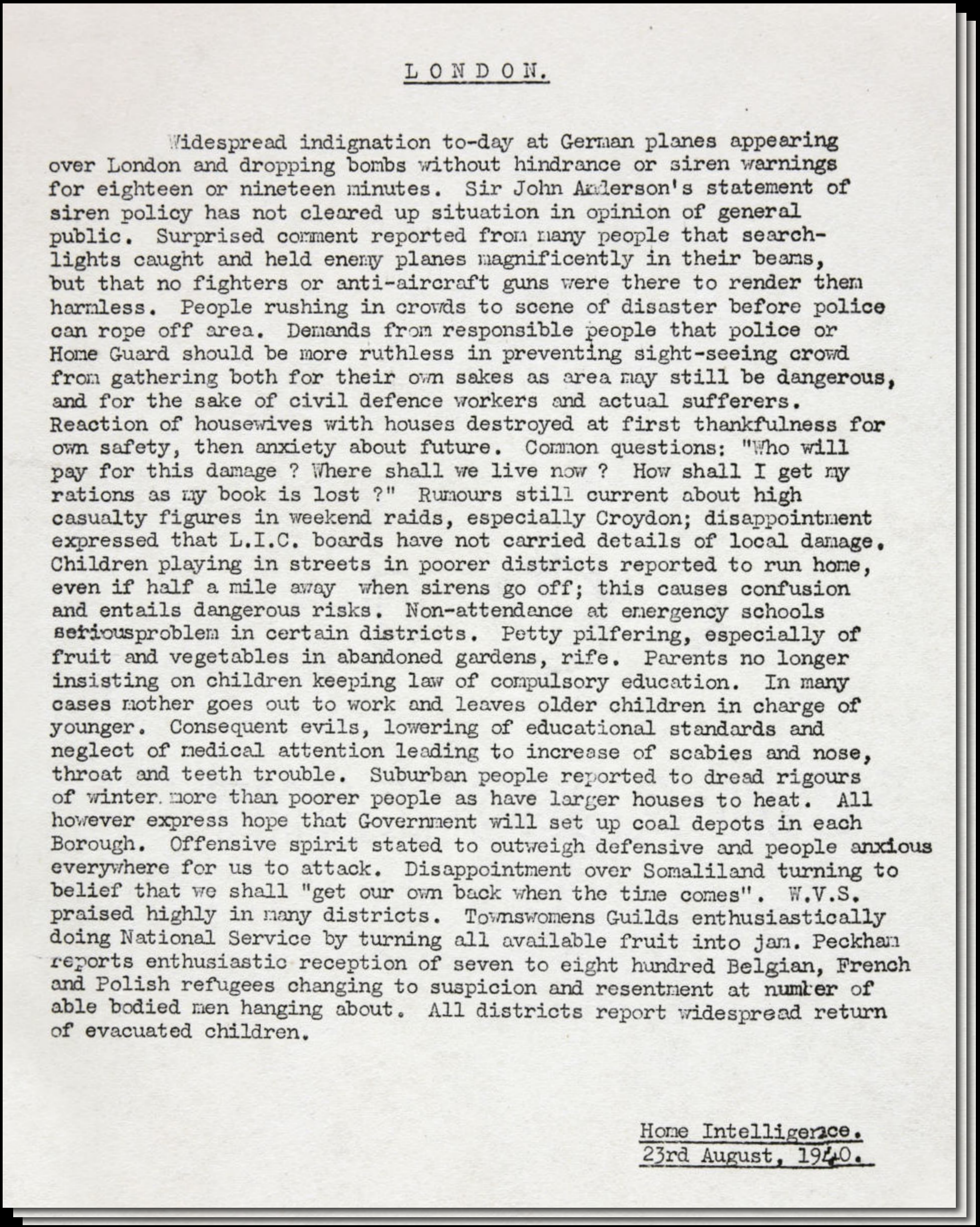
TOP RIGHT: An RAF sergeant plotting a course at an RAF Coastal Command base in January 1940.

Coastal Command was created in the reorganization of 1936. Its role was to provide a dedicated air force for attacks on enemy shipping in the seas around Britain, for protection of British convoys, and for reconnaissance over sea and coastal areas. On the outbreak of war, it was commanded by Air Chief Marshal Frederick Bowhill with three Group headquarters at Plymouth, Chatham and Rosyth, where the airmen worked side-by-side with naval staff. Coastal Command had 19 squadrons of largely obsolescent aircraft on the outbreak of war but expanded rapidly as the war at sea became a greater threat in 1940. From May 1940 onwards, Coastal Command had to undertake dangerous long-range reconnaissance missions over the North Sea and the Channel, and losses of its slow and vulnerable aircraft were high. Over a sixth-month period, the command lost 158 aircraft and 600 crew out of an August 1940 strength of only 470 planes. In the war at sea, the command could contribute little with old-fashioned or ineffective equipment. It became a more modern and effective fighting force only from 1941 onwards.

BELOW: The wreckage of Stanley Street in the south coast city of Portsmouth after a heavy raid in August 1940. Portsmouth was one of a handful of ports hit heavily over the summer months, and long before the onset of the Blitz on London and other cities.

MORALE LETTERS

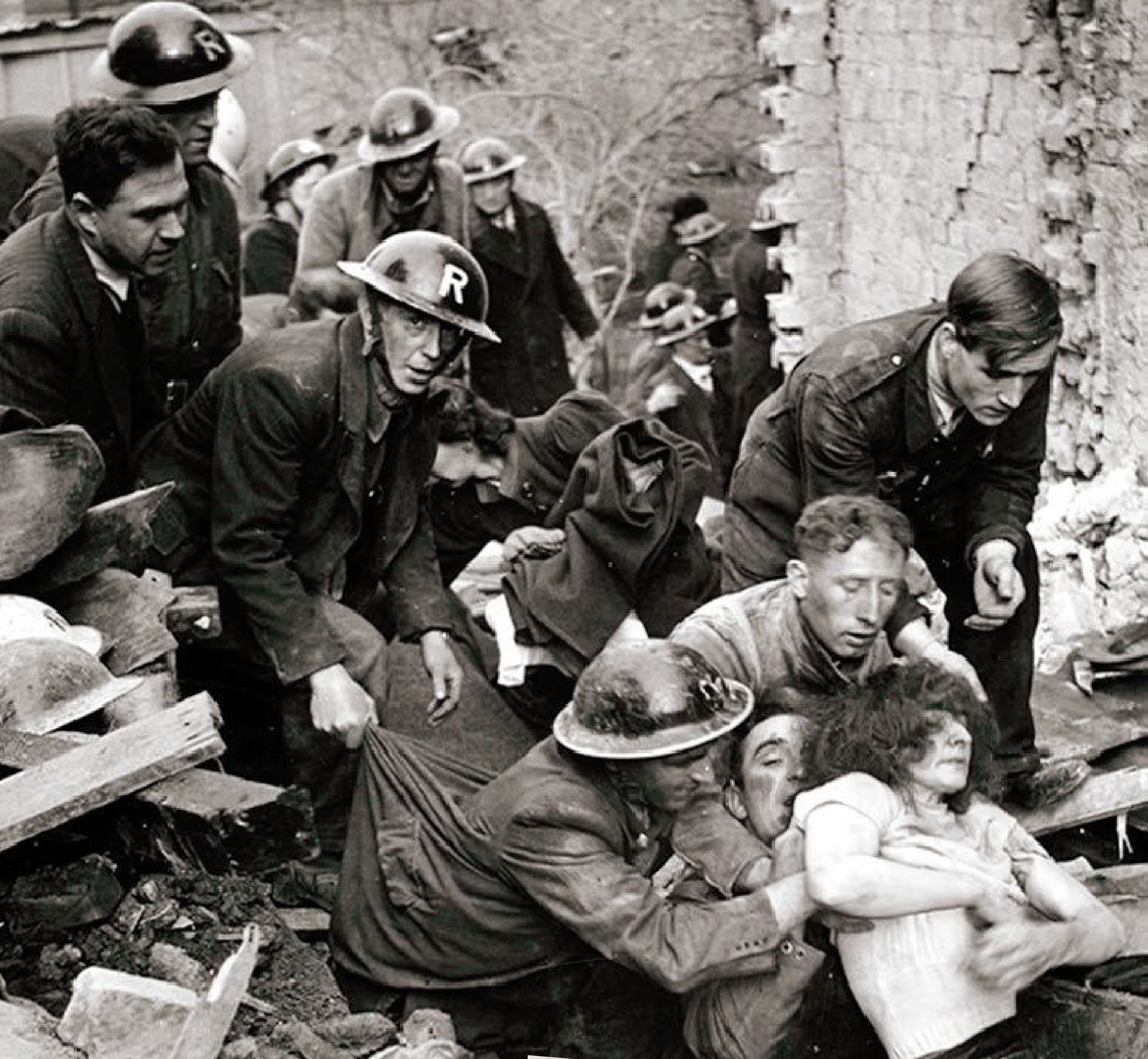
British Home Intelligence reports from 23 August 1940. The reports were collected from local informers and sent to the Ministry of Information where they were used to draw up daily assessments of morale. Despite the onset of bombing, the London report noted the widespread return of evacuated children.



LONDON.

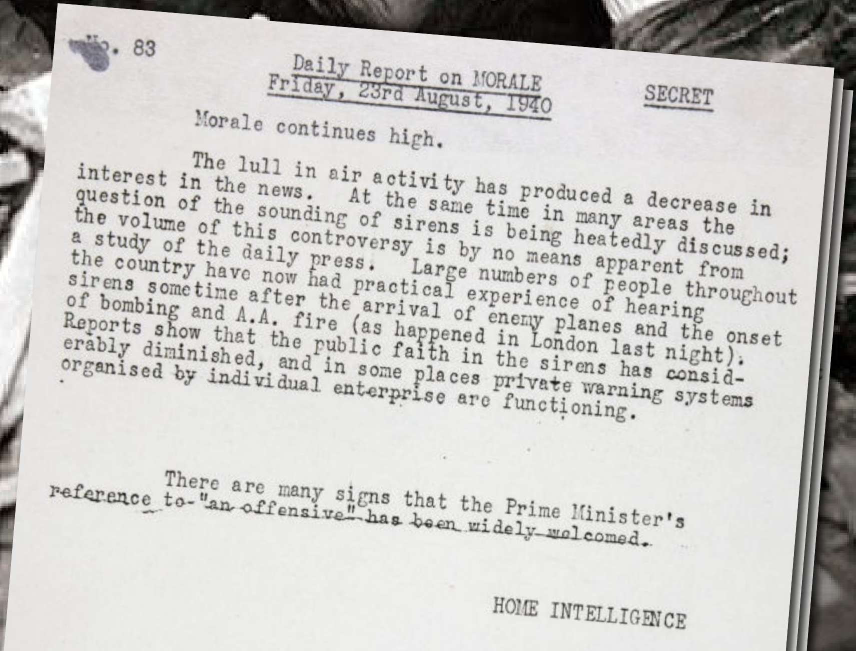
Widespread indignation to-day at German planes appearing over London and dropping bombs without hindrance or siren warnings for eighteen or nineteen minutes. Sir John Anderson's statement of siren policy has not cleared up situation in opinion of general public. Surprised comment reported from many people that searchlights caught and held enemy planes magnificently in their beams, but that no fighters or anti-aircraft guns were there to render them harmless. People rushing in crowds to scene of disaster before police can rope off area. Demands from responsible people that police or Home Guard should be more ruthless in preventing sight-seeing crowd from gathering both for their own sakes as area may still be dangerous, and for the sake of civil defence workers and actual sufferers. Reaction of housewives with houses destroyed at first thankfulness for own safety, then anxiety about future. Common questions: "Who will pay for this damage ? Where shall we live now ? How shall I get my rations as my book is lost ?" Rumours still current about high casualty figures in weekend raids, especially Croydon; disappointment expressed that L.I.C. boards have not carried details of local damage. Children playing in streets in poorer districts reported to run home, even if half a mile away when sirens go off; this causes confusion and entails dangerous risks. Non-attendance at emergency schools seriousproblem in certain districts. Petty pilfering, especially of fruit and vegetables in abandoned gardens, rife. Parents no longer insisting on children keeping law of compulsory education. In many cases mother goes out to work and leaves older children in charge of younger. Consequent evils, lowering of educational standards and neglect of medical attention leading to increase of scabies and nose, throat and teeth trouble. Suburban people reported to dread rigours of winter more than poorer people as have larger houses to heat. All however express hope that Government will set up coal depots in each Borough. Offensive spirit stated to outweigh defensive and people anxious everywhere for us to attack. Disappointment over Somaliland turning to belief that we shall "get our own back when the time comes". W.V.S. praised highly in many districts. Townswomens Guilds enthusiastically doing National Service by turning all available fruit into jam. Peckham reports enthusiastic reception of seven to eight hundred Belgian, French and Polish refugees changing to suspicion and resentment at number of able bodied men hanging about. All districts report widespread return of evacuated children.

Home Intelligence.
23rd August, 1940.



RUBBLE RESCUE

While the reports may have assured the Ministry that morale was high, the Blitz of 1940 and 1941 meant that rescues from the rubble, like the one shown here, were all too often necessary.



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Daily Report on MORALE
Friday, 23rd August, 1940 SECRET

Morale continues high.

The lull in air activity has produced a decrease in
interest in the news. At the same time in many areas the
question of the sounding of sirens is being heatedly discussed;
the volume of this controversy is by no means apparent from
a study of the daily press. Large numbers of people throughout
the country have now had practical experience of hearing
sirens sometime after the arrival of enemy planes and the onset
of bombing and A.A. fire (as happened in London last night).
Reports show that the public faith in the sirens has consid-
erably diminished, and in some places private warning systems
organised by individual enterprise are functioning.

There are many signs that the Prime Minister's
reference to "an offensive" has been widely welcomed.

HOME INTELLIGENCE

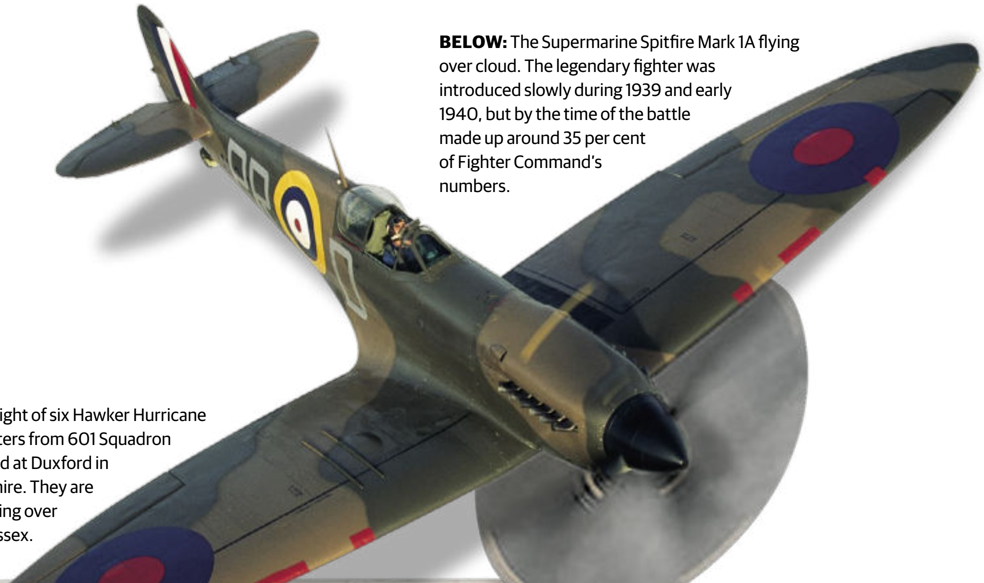
THE HURRICANE AND THE SPITFIRE

Two aircraft, the Hawker Hurricane and Supermarine Spitfire, were the mainstays of Fighter Command during the Battle of Britain. They were both developed in the mid-1930s during the period when the RAF was searching for a high-performance modern monoplane fighter. Both depended on the simultaneous development of the Rolls-Royce Merlin engine, without which the high performance of the two fighters would not have been possible.

The Hurricane and Spitfire were very different aircraft but were created at almost exactly the same time. The Hurricane was designed in 1934–35 by the Hawker Aircraft Company's Sydney Camm in response to an Air Ministry specification. His first design was turned down, but he immediately began a "private venture" design built around the Merlin engine which the RAF liked and ordered into production in June 1936. The design was based on the techniques used in Hawker's successful biplane fighters, and the thick wing, covered with fabric rather than metal, and two-blade propeller made the aircraft obsolescent by the standards of the new generation of fighters being produced in Europe. It was nevertheless a very sturdy aircraft, with a tight turning circle. It was easy to fly and easily repaired. By December 1938, it was in service with the RAF and 500 had been delivered by the outbreak of war.

The Spitfire – named by the owner of the Vickers Supermarine Aircraft Company after his daughter, a little "spitfire" – began life as Type 300, an advanced fighter design by the chief designer at Supermarine, R. J. Mitchell. It, too, was planned around the evolving Rolls-Royce PV-XII engine, soon to be christened the Merlin.

Mitchell adopted a number of new advances, many drawn from the United States aviation industry, including a retractable undercarriage, light thin wings with a characteristic elliptical shape, and a closed cockpit. It was modern monoplane design with an all-metal fuselage, light, easy to handle and capable of regular modification and upgrading. It had a top speed during the Battle of Britain of at least 560 kph (350 mph) compared with around 530 kph (330 mph) for the Hurricane. The Air Ministry ordered



BELOW: The Supermarine Spitfire Mark 1A flying over cloud. The legendary fighter was introduced slowly during 1939 and early 1940, but by the time of the battle made up around 35 per cent of Fighter Command's numbers.

UF◎N
UF◎P
UF◎W
UF◎Y
UF◎D

BELOW: A flight of six Hawker Hurricane Mark IIB fighters from 601 Squadron RAF stationed at Duxford in Cambridgeshire. They are seen here flying over Thaxted in Essex.

REGINALD MITCHELL (1895–1937)

R. J. Mitchell began his engineering career helping to design high-performance locomotives. He learned aeronautics in his spare time, and became an aeronautical engineer for the Vickers Supermarine works in Southampton, where he was appointed chief designer in 1919. He designed some 24 aircraft, but is best known as the designer of the Spitfire, which he began working on in summer 1934. He based its high performance on his designs for the Schneider Trophy-winning S6B racing aircraft and another fighter project, the Type 224, which the RAF rejected. He was a shy but single-minded personality, who struggled against ill health in the last years of his life while completing the Spitfire. He died of cancer in June 1937, and his design was taken over and improved by his successor, Joseph Smith.

ABOVE: Reginald Mitchell (far right), designer of the Spitfire, at work on an S6B seaplane which won the Schneider Trophy in 1928 at a speed of 528 kph (328 mph).

THE ROLLS-ROYCE MERLIN ENGINE

The Rolls-Royce Merlin engine, named after the small bird of prey, was one of the war's most successful aero-engines. Around 150,000 were produced, used principally in the British Spitfire, Hurricane, Lancaster, Halifax and Mosquito, and later in the American P-51 Mustang fighter. A liquid-cooled V12 piston engine, the Merlin, first designated the PV-12, was developed in 1934–35. It suffered a great many teething problems until the war, by which time Rolls-Royce had produced an engine of high reliability, capable of regular modification and upgrading. When used with high-octane fuels, the engine gave British fighters a great boost during the Battle of Britain, though it could not be used easily in a steep dive until the invention in March 1941 of "Miss Shilling's orifice", a diaphragm developed by the engineer Beatrice Shilling to prevent fuel from escaping from the carburettor during a dive.

ABOVE: The Merlin engine under construction. Here the crank case assembly bay can be seen, with cylinder studs in the process of being fitted.

Mitchell to produce a prototype in January 1935 and the first Spitfire flew on 5 March 1936, four months after the first Hurricane. It proved so successful that in June 1936 the Ministry ordered over 300 aircraft, but production hold-ups led to the proposed cancellation of the model in 1938. Vickers succeeded in persuading the RAF to persevere with it and within three years the Spitfire had become the backbone of the British wartime fighter force. The first Spitfires entered service on 4 August 1938 with 19 Squadron stationed at Duxford, near Cambridge. The last Spitfire flight with the RAF took place in 1957.

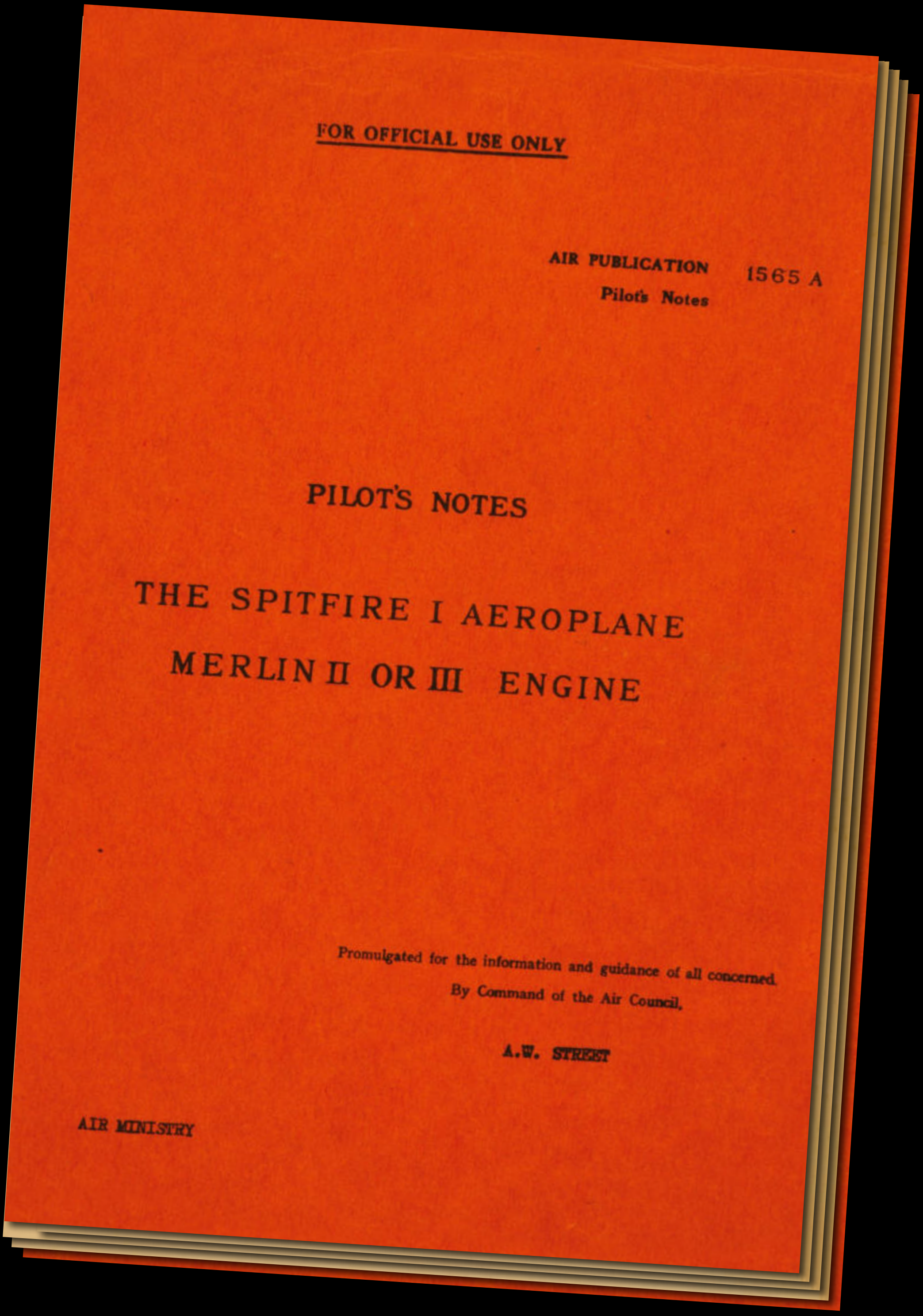
Spitfire production took some time to get going during 1939 and 1940, and during the Battle of Britain there were more Hurricane than Spitfire squadrons. The Spitfire also took higher losses, partly because they were detailed to attack the German Me109 fighters while the Hurricanes mainly engaged the slower-flying bombers. At the end of the battle there were still 33 Hurricane squadrons against 20 Spitfire squadrons. The Hurricanes had some disadvantages in combat but the decision to replace the two-blade propeller with the standard Rotol constant-speed propeller, which became standard during the battle, improved performance a good deal. So too did the decision to replace fabric wings with metal-covered wings. The biggest disadvantage was the position of the fuel tank in front of the pilot, which resulted in severe burns for pilots when their tanks were hit by enemy fire. The Merlin-powered Spitfire was a successful design except for the inability to dive sharply without losing fuel supply to the engine or placing undue stress on the pilot.

In all, some 14,000 Hurricanes were built during its combat lifespan, including modified designs such as the Sea Hurricane, which operated from aircraft carriers. There were 20,351 Spitfires built, the most of any wartime Allied fighter, and there were 24 variants. There was also a version for use at sea, the Seafire. Over the years it is the Spitfire that has become the iconic aircraft of the Battle of Britain, but the sturdy workhorse Hurricane also contributed a great deal to the success of the RAF in 1940.

BELOW: The Spitfire production line at the Vickers Supermarine factory in Southampton c.1939–40. Production was decentralized to avoid the risk of bomb damage and a large factory set up by the Morris car manufacturer, Lord Nuffield, at Castle Bromwich.

OFFICIAL PILOT'S NOTES FOR THE SPITFIRE FIGHTERS

These are extracts from the pages of the official Pilot's Notes for Spitfire fighters. It was produced by the Air Ministry for distribution to all pilots. The notes give the pilots useful information and advice about a wide range of subjects, including the problems that may be encountered when undertaking aerobatics. The annotated diagrams of the plane's port and starboard sides of the cockpit are particularly fascinating, and would have been vital knowledge to have.



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AIR PUBLICATION 1565 A
Pilot's Notes

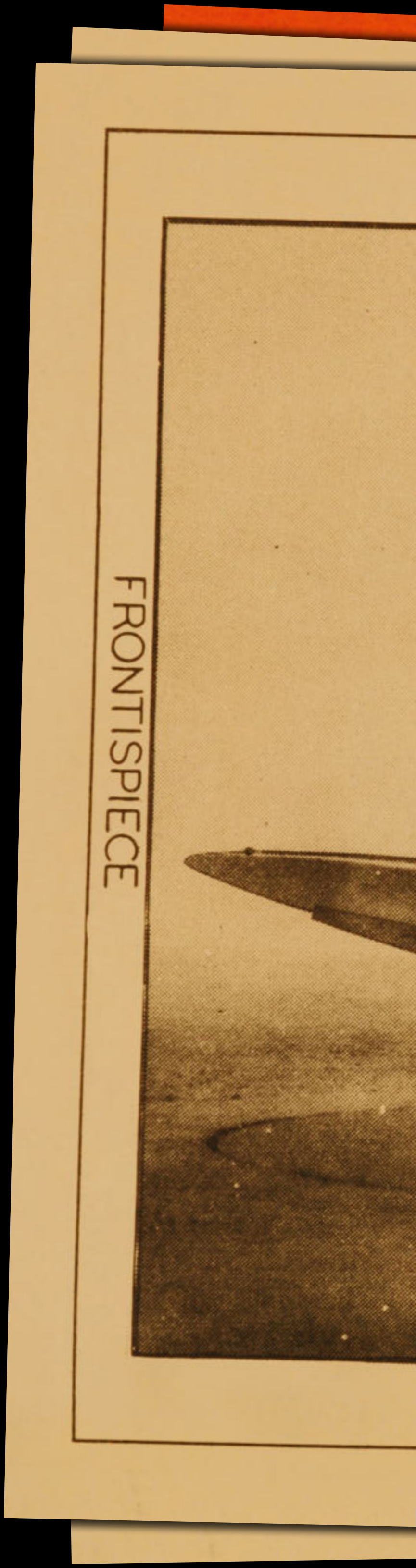
PILOT'S NOTES

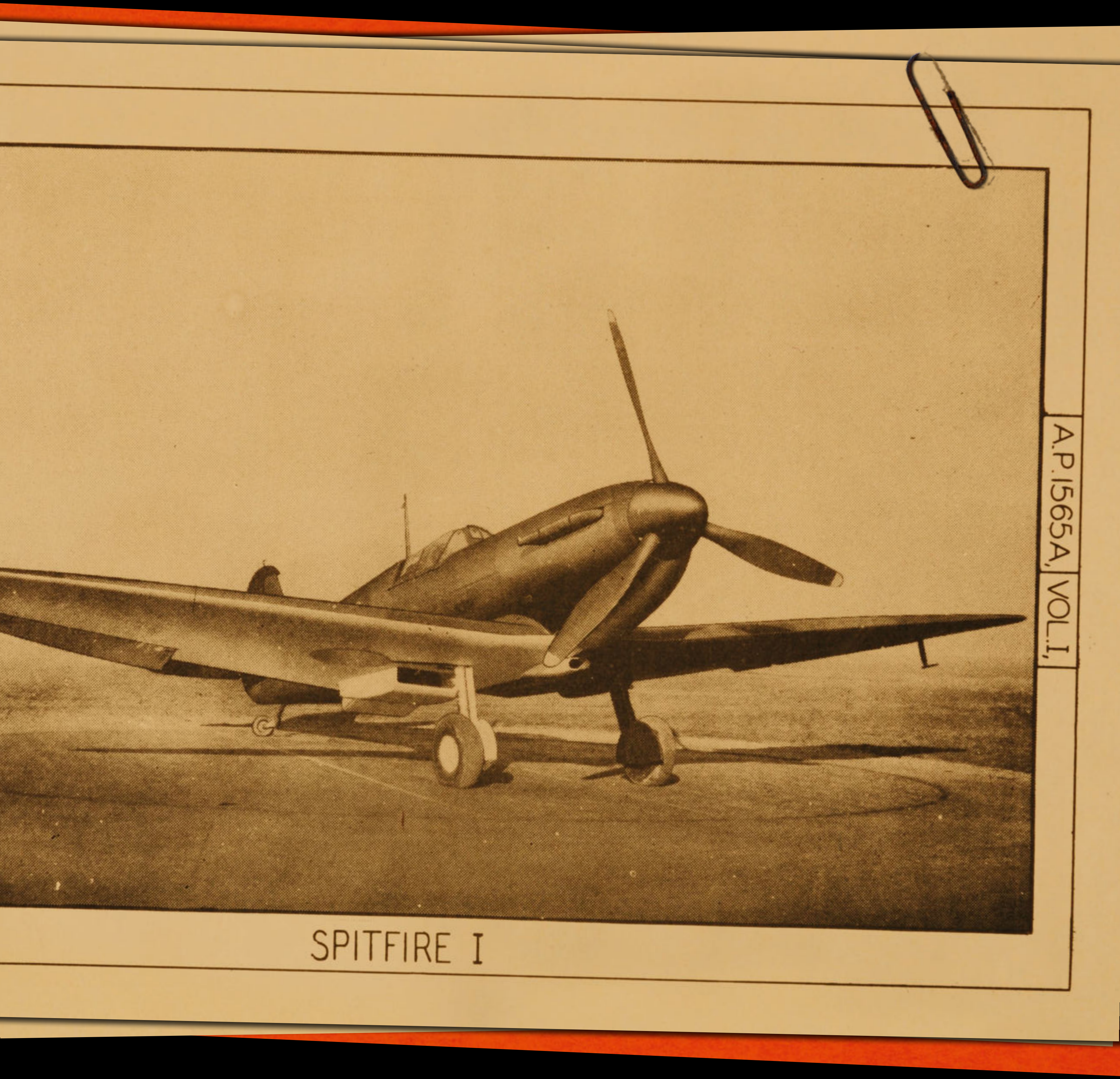
THE SPITFIRE I AEROPLANE
MERLIN II OR III ENGINE

Promulgated for the information and guidance of all concerned.
By Command of the Air Council,

A.W. STREET

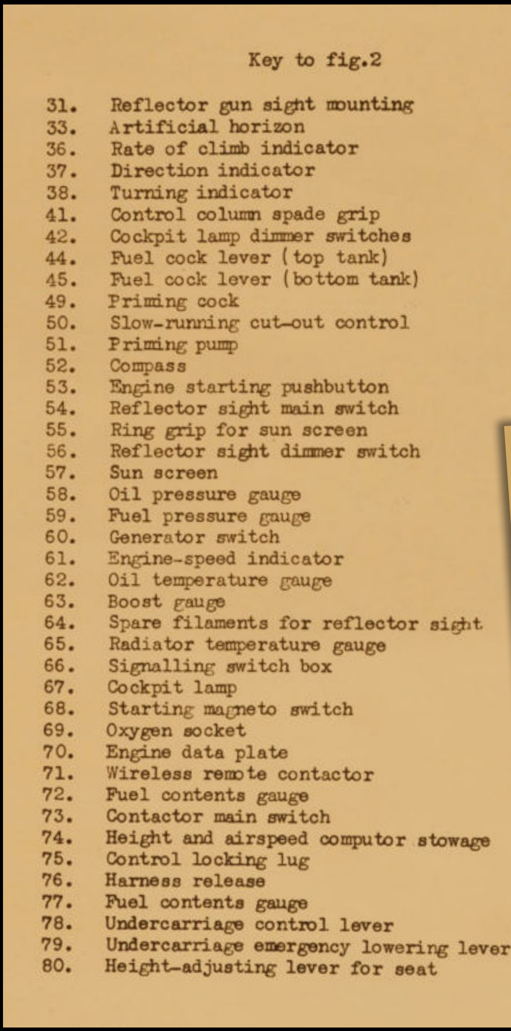
AIR MINISTRY





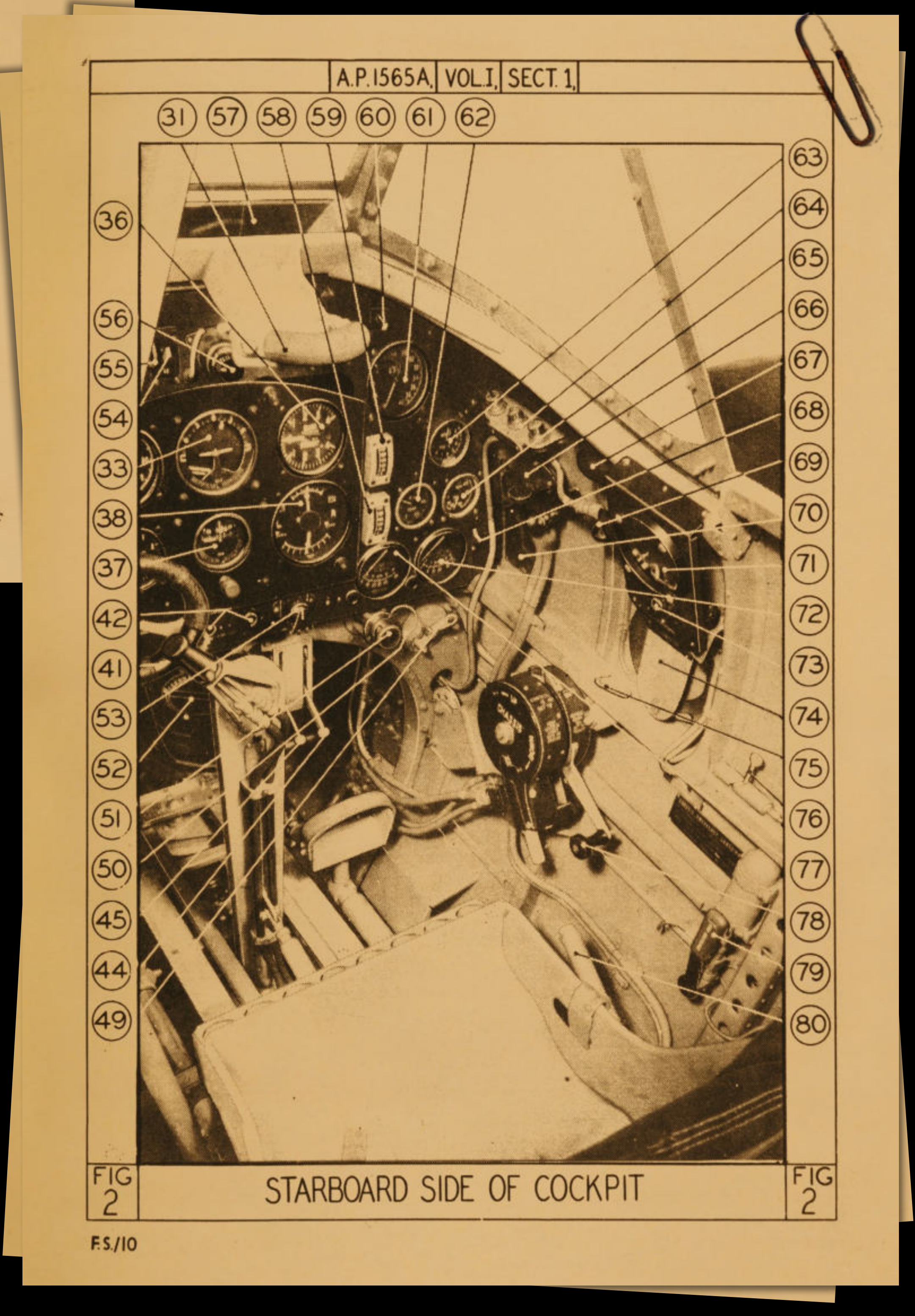
A.P.1565A, VOL.I,

SPITFIRE I



Key to fig.2

31. Reflector gun sight mounting
33. Artificial horizon
36. Rate of climb indicator
37. Direction indicator
38. Turning indicator
41. Control column spade grip
42. Cockpit lamp dimmer switches
44. Fuel cock lever (top tank)
45. Fuel cock lever (bottom tank)
49. Priming cock
50. Slow-running cut-out control
51. Priming pump
52. Compass
53. Engine starting pushbutton
54. Reflector sight main switch
55. Ring grip for sun screen
56. Reflector sight dimmer switch
57. Sun screen
58. Oil pressure gauge
59. Fuel pressure gauge
60. Generator switch
61. Engine-speed indicator
62. Oil temperature gauge
63. Boost gauge
64. Spare filaments for reflector sight
65. Radiator temperature gauge
66. Signalling switch box
67. Cockpit lamp
68. Starting magneto switch
69. Oxygen socket
70. Engine data plate
71. Wireless remote contactor
72. Fuel contents gauge
73. Contactor main switch
74. Height and airspeed computor stowage
75. Control locking lug
76. Harness release
77. Fuel contents gauge
78. Undercarriage control lever
79. Undercarriage emergency lowering lever
80. Height-adjusting lever for seat



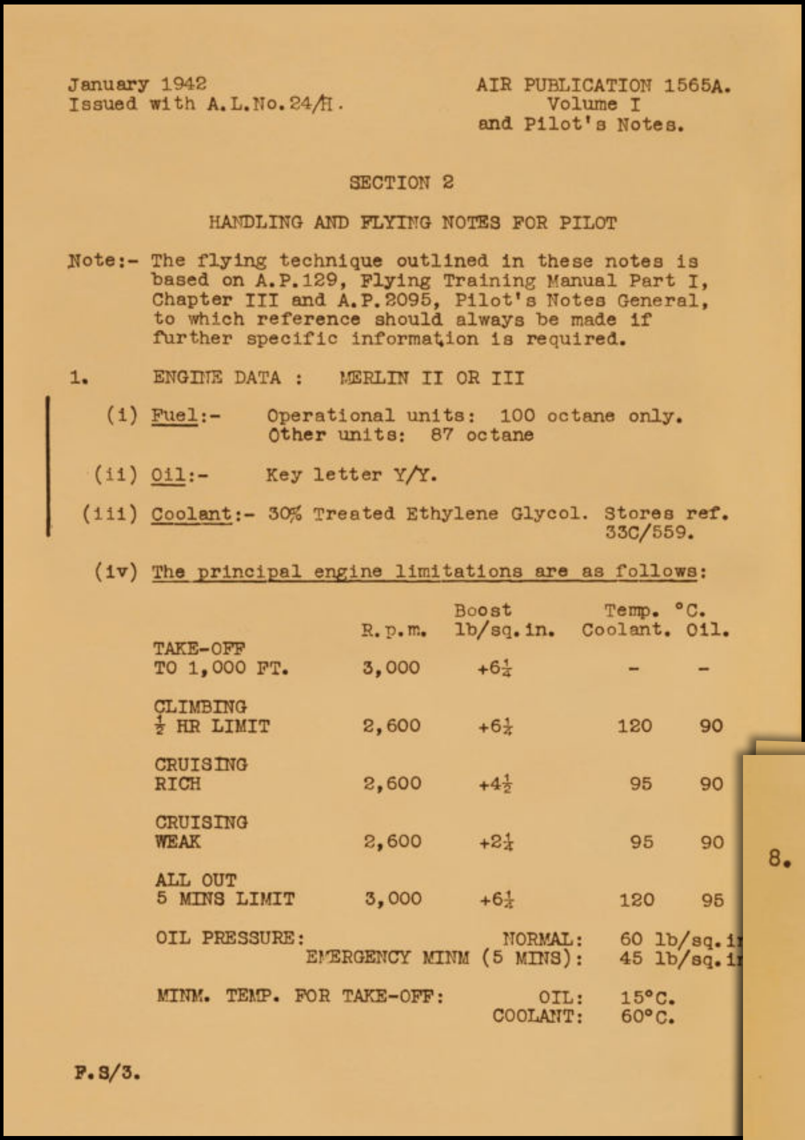
A.P.1565A, VOL.I, SECT. 1,

FIG 2

STARBOARD SIDE OF COCKPIT

FIG 2

F.S./10



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Volume I
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SECTION 2

HANDLING AND FLYING NOTES FOR PILOT

Note:- The flying technique outlined in these notes is based on A.P.129, Flying Training Manual Part I, Chapter III and A.P.2095, Pilot's Notes General, to which reference should always be made if further specific information is required.

1. ENGINE DATA : MERLIN II OR III

(i) Fuel:- Operational units: 100 octane only.
Other units: 87 octane

(ii) Oil:- Key letter Y/Y.

(iii) Coolant:- 30% Treated Ethylene Glycol. Stores ref. 33C/559.

(iv) The principal engine limitations are as follows:

	R.p.m.	Boost lb/sq.in.	Temp. °C. Coolant.	Oil.
TAKE-OFF TO 1,000 FT.	3,000	+6¼	-	-
CLIMBING ½ HR LIMIT	2,600	+6¼	120	90
CRUISING RICH	2,600	+4½	95	90
CRUISING WEAK	2,600	+2¼	95	90
ALL OUT 5 MINS LIMIT	3,000	+6¼	120	95

OIL PRESSURE: NORMAL: 60 lb/sq.i
EMERGENCY MINM (5 MINS): 45 lb/sq.i

MINM. TEMP. FOR TAKE-OFF: OIL: 15°C.
COOLANT: 60°C.

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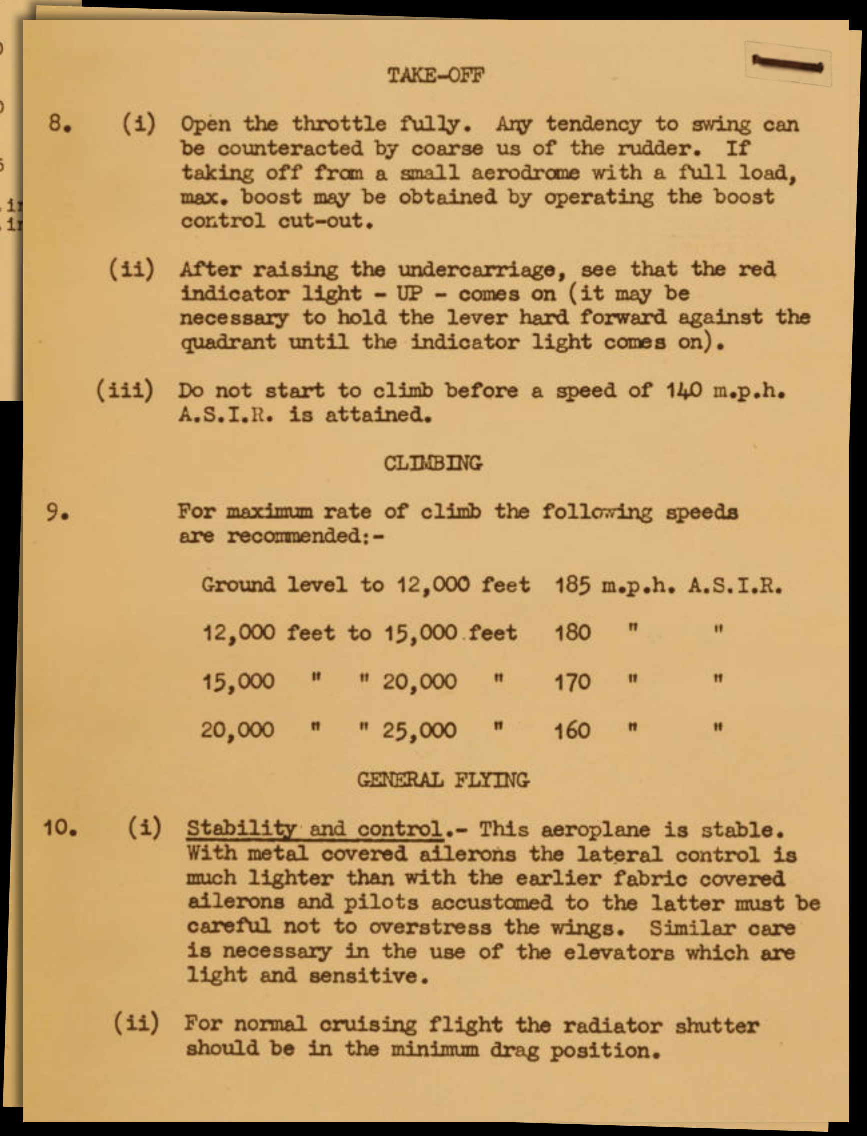


TAKE-OFF

8. (i) Open the throttle fully. Any tendency to swing can be counteracted by coarse us of the rudder. If taking off from a small aerodrome with a full load, max. boost may be obtained by operating the boost control cut-out.

(ii) After raising the undercarriage, see that the red indicator light - UP - comes on (it may be necessary to hold the lever hard forward against the quadrant until the indicator light comes on).

(iii) Do not start to climb before a speed of 140 m.p.h. A.S.I.R. is attained.

CLIMBING

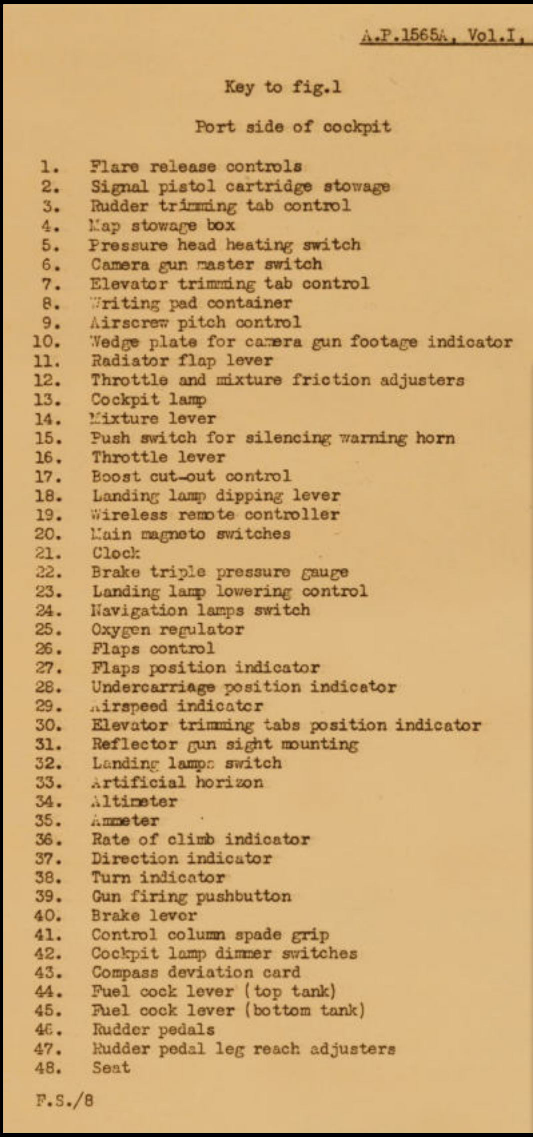
9. For maximum rate of climb the following speeds are recommended:-

Ground level to 12,000 feet	185 m.p.h. A.S.I.R.
12,000 feet to 15,000 feet	180 " "
15,000 " " 20,000 "	170 " "
20,000 " " 25,000 "	160 " "

GENERAL FLYING

10. (i) Stability and control.- This aeroplane is stable. With metal covered ailerons the lateral control is much lighter than with the earlier fabric covered ailerons and pilots accustomed to the latter must be careful not to overstress the wings. Similar care is necessary in the use of the elevators which are light and sensitive.

(ii) For normal cruising flight the radiator shutter should be in the minimum drag position.



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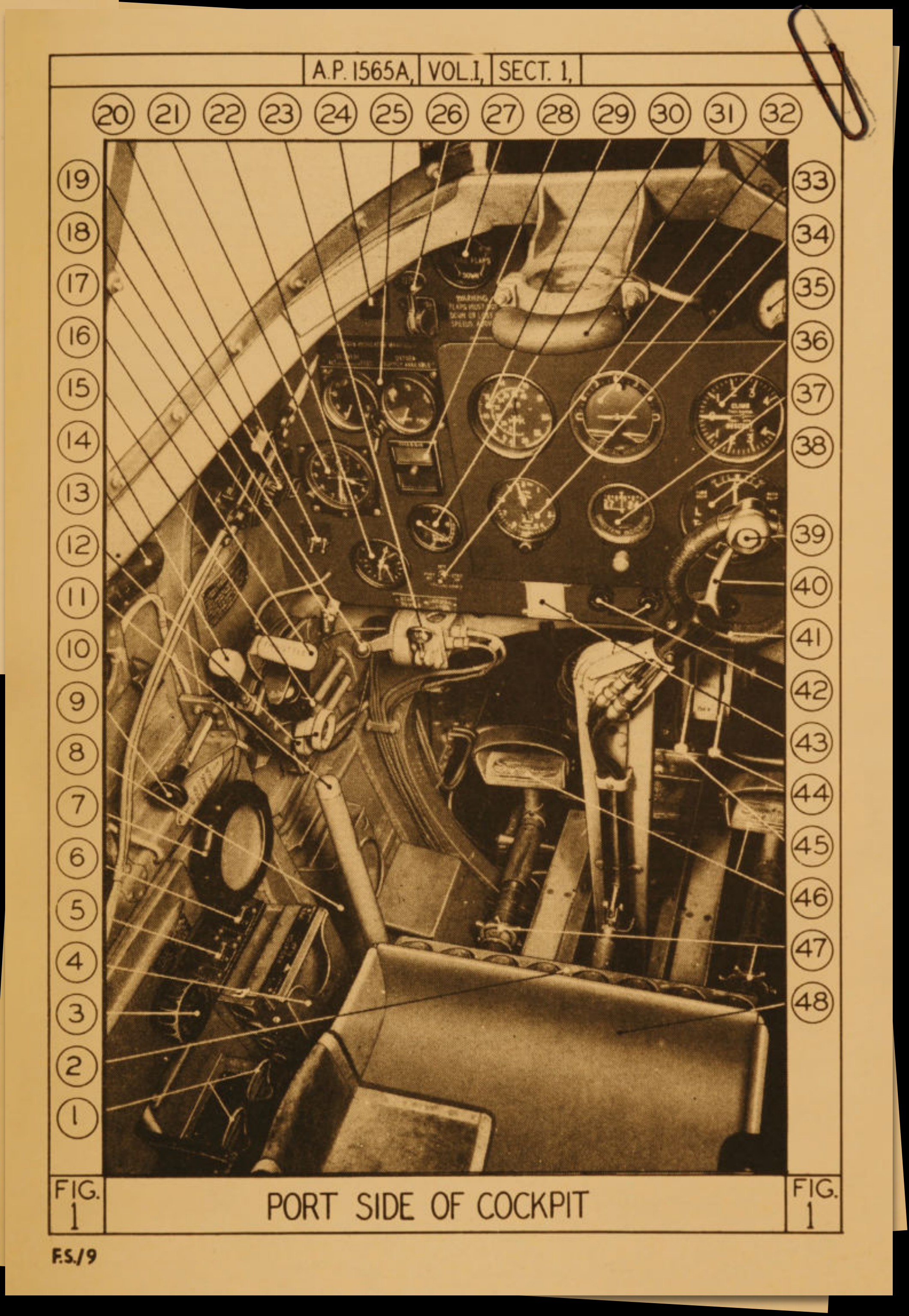
Key to fig.1

Port side of cockpit

1. Flare release controls
2. Signal pistol cartridge stowage
3. Rudder trimming tab control
4. Map stowage box
5. Pressure head heating switch
6. Camera gun master switch
7. Elevator trimming tab control
8. Writing pad container
9. Airscrew pitch control
10. Wedge plate for camera gun footage indicator
11. Radiator flap lever
12. Throttle and mixture friction adjusters
13. Cockpit lamp
14. Mixture lever
15. Push switch for silencing warning horn
16. Throttle lever
17. Boost cut-out control
18. Landing lamp dipping lever
19. Wireless remote controller
20. Main magneto switches
21. Clock
22. Brake triple pressure gauge
23. Landing lamp lowering control
24. Navigation lamps switch
25. Oxygen regulator
26. Flaps control
27. Flaps position indicator
28. Undercarriage position indicator
29. Airspeed indicator
30. Elevator trimming tabs position indicator
31. Reflector gun sight mounting
32. Landing lamps switch
33. Artificial horizon
34. Altimeter
35. Ammeter
36. Rate of climb indicator
37. Direction indicator
38. Turn indicator
39. Gun firing pushbutton
40. Brake lever
41. Control column spade grip
42. Cockpit lamp dimmer switches
43. Compass deviation card
44. Fuel cock lever (top tank)
45. Fuel cock lever (bottom tank)
46. Rudder pedals
47. Rudder pedal leg reach adjusters
48. Seat

F.S./8



A.P. 1565A, VOL.I, SECT. 1,

FIG. 1 PORT SIDE OF COCKPIT FIG. 1

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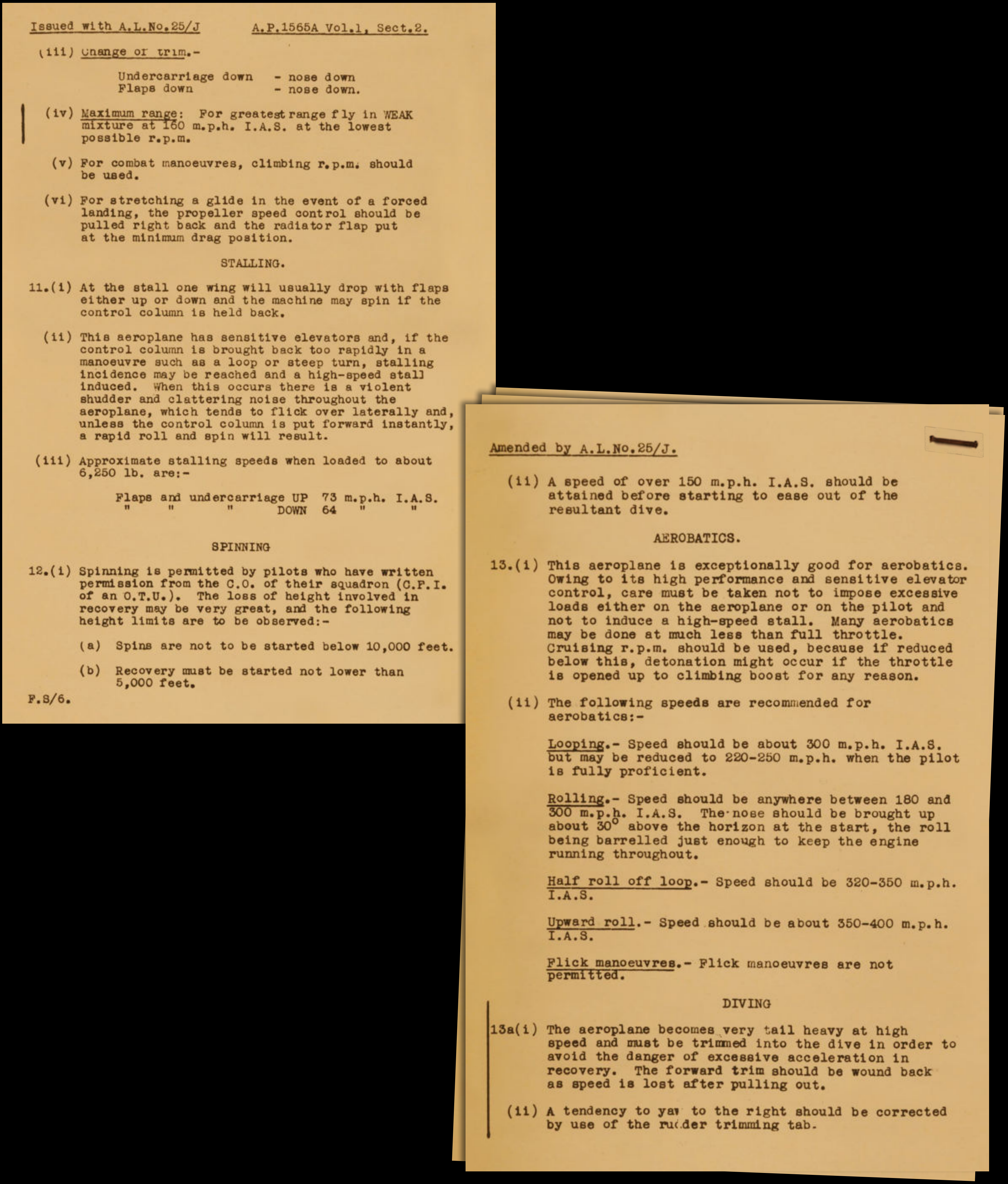


Issued with A.L.No.25/J A.P.1565A Vol.1, Sect.2.

(iii) Change of trim.-

Undercarriage down - nose down
Flaps down - nose down.

(iv) Maximum range: For greatest range fly in WEAK mixture at 160 m.p.h. I.A.S. at the lowest possible r.p.m.

(v) For combat manoeuvres, climbing r.p.m. should be used.

(vi) For stretching a glide in the event of a forced landing, the propeller speed control should be pulled right back and the radiator flap put at the minimum drag position.

STALLING.

11.(i) At the stall one wing will usually drop with flaps either up or down and the machine may spin if the control column is held back.

(ii) This aeroplane has sensitive elevators and, if the control column is brought back too rapidly in a manoeuvre such as a loop or steep turn, stalling incidence may be reached and a high-speed stall induced. When this occurs there is a violent shudder and clattering noise throughout the aeroplane, which tends to flick over laterally and, unless the control column is put forward instantly, a rapid roll and spin will result.

(iii) Approximate stalling speeds when loaded to about 6,250 lb. are:-

Flaps and undercarriage UP 73 m.p.h. I.A.S.
" " " DOWN 64 " "

SPINNING

12.(i) Spinning is permitted by pilots who have written permission from the C.O. of their squadron (C.F.I. of an O.T.U.). The loss of height involved in recovery may be very great, and the following height limits are to be observed:-

(a) Spins are not to be started below 10,000 feet.

(b) Recovery must be started not lower than 5,000 feet.

F.S/6.

Amended by A.L.No.25/J.

(ii) A speed of over 150 m.p.h. I.A.S. should be attained before starting to ease out of the resultant dive.

AEROBATICS.

13.(i) This aeroplane is exceptionally good for aerobatics. Owing to its high performance and sensitive elevator control, care must be taken not to impose excessive loads either on the aeroplane or on the pilot and not to induce a high-speed stall. Many aerobatics may be done at much less than full throttle. Cruising r.p.m. should be used, because if reduced below this, detonation might occur if the throttle is opened up to climbing boost for any reason.

(ii) The following speeds are recommended for aerobatics:-

Looping.- Speed should be about 300 m.p.h. I.A.S. but may be reduced to 220-250 m.p.h. when the pilot is fully proficient.

Rolling.- Speed should be anywhere between 180 and 300 m.p.h. I.A.S. The nose should be brought up about 30° above the horizon at the start, the roll being barrelled just enough to keep the engine running throughout.

Half roll off loop.- Speed should be 320-350 m.p.h. I.A.S.

Upward roll.- Speed should be about 350-400 m.p.h. I.A.S.

Flick manoeuvres.- Flick manoeuvres are not permitted.

DIVING

13a(i) The aeroplane becomes very tail heavy at high speed and must be trimmed into the dive in order to avoid the danger of excessive acceleration in recovery. The forward trim should be wound back as speed is lost after pulling out.

(ii) A tendency to yaw to the right should be corrected by use of the rudder trimming tab.

ARP WARDEN

An emotional scene as a female ARP warden rescues a young girl from a bombed London building in 1940. Female civil defence workers were vital to rescue and rehabilitation.

DETECTING THE ENEMY

In 1934, the Air Ministry established a scientific committee to investigate the whole question of effective air defence. It was chaired by Henry Tizard and included the Air Ministry's own Director of Scientific Research, H. E. Wimperis. At its first meeting it was decided to ask the superintendent of the Radio Department at the National Physical Laboratory, Robert Watson-Watt, to supply advice on the possibility of using radio waves either to disable aircraft or to detect them in flight. Watson-Watt rejected the first, but suggested that radio pulses could indeed be reflected from aircraft and the results recorded, so allowing enemy aircraft to be tracked.

On 26 February 1935, a first experiment was carried out at Weedon in Northamptonshire which clearly demonstrated that an aircraft reflected electro-magnetic energy and that those reflections could be detected by the use of a cathode-ray apparatus. This experiment launched the British development of what became known as RDF or radio direction finding, and later still came to be called radar. Radar research was not confined to Britain. In the mid-1930s research and development work was also carried out in Germany, Japan, France, Italy, the United States, the Netherlands and the Soviet Union, though the most significant use of radar was to be found by the outbreak of war only in Britain and Germany.

ABOVE: A group of airmen and WAAF operators at work in the receiver hut at the radar station at Ventnor on the Isle of Wight during the battle. The information from radar detection could be sent immediately by telephone to Fighter Command headquarters.

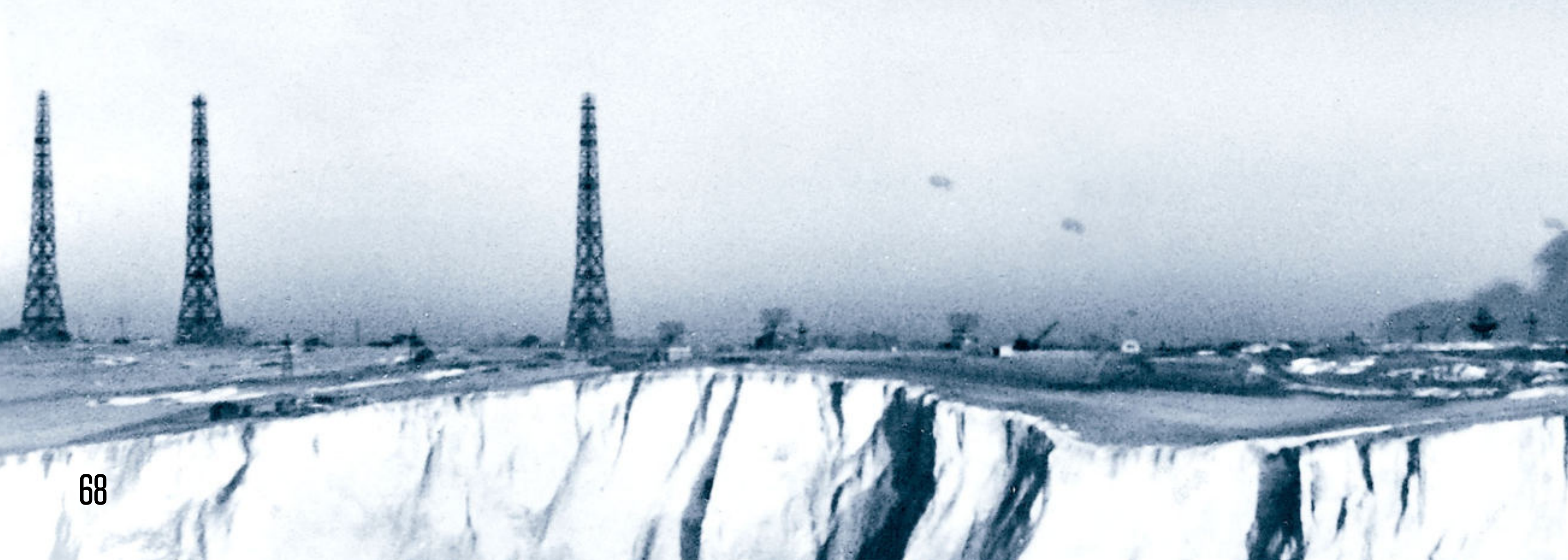
The first British radar sets for detecting aircraft were operational by the end of 1939. The possibilities of radar were regarded in Britain as so important that plans were laid down as early as the autumn of 1935 for a protective string of radar stations around the British coast. The system became known as Home Chain and final approval for a network of 20 stations using so-called "Home Chain" radar was granted in August 1937. By this time Watson-Watt and his team had developed effective transmitting and detecting equipment. When war came in September 1939, there were 18 Home Chain stations operational around the English coast and two in Scotland.

The importance of radar lay in the system designed to transmit the information seen on the radar screen quickly to the operations rooms of Fighter Command. The information was first sent to a "filter room", then on to the Command's chief operations room at Bentley Priory and from there to the fighter sectors involved. Radar could generally detect incoming aircraft at around 130 kilometres (80 miles) distance and the development of an Identification Friend or Foe (IFF) system meant that it was possible to distinguish enemy from friendly aircraft. A number of Home Chain Low stations were also developed to cope with aircraft flying at lower than 300 metres (1,000 feet), but could detect aircraft at a distance of only 50 kilometres (30 miles). Radar did not yet work

ROBERT WATSON-WATT (1892–1973)

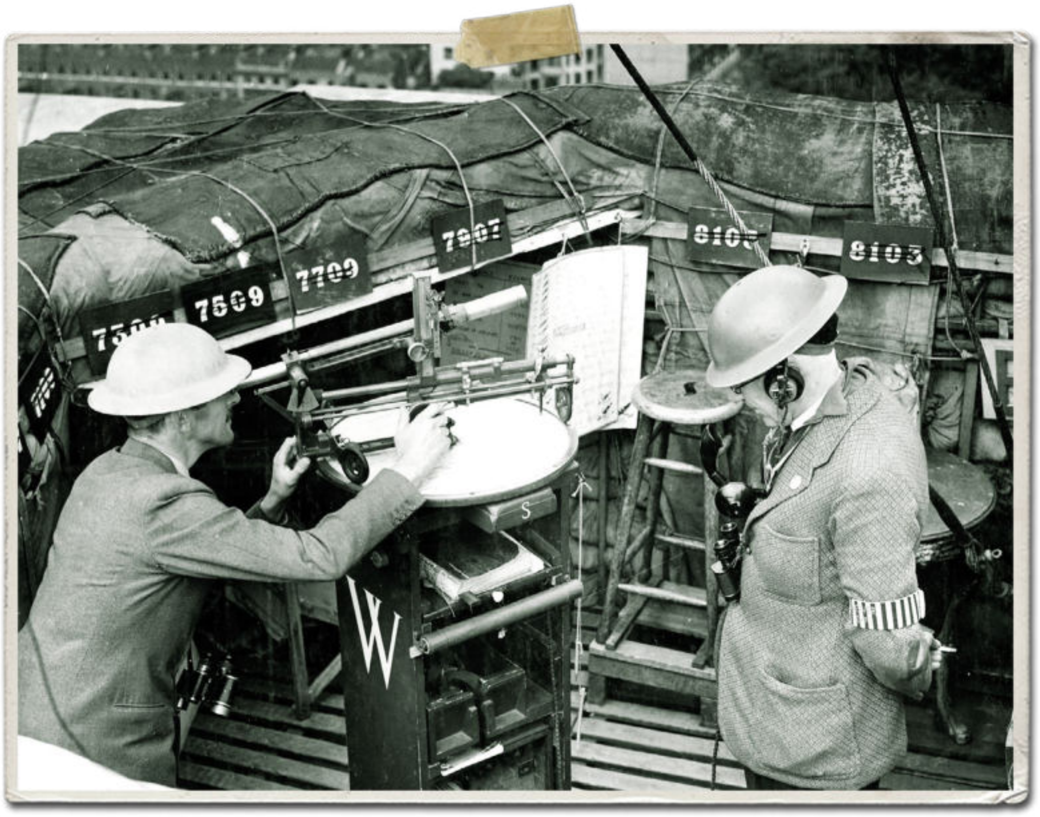
Robert Watson-Watt, a descendant of James Watt, the inventor of the steam engine, was a radio engineer who began his career with the Meteorological Office in 1915. Here he began work on predicting thunderstorms by the use of radio signals. He was assigned to the Air Ministry and in 1927 was made director of the Radio Research Station in the National Physical Laboratory. His work attracted the attention of the Air Ministry in the 1930s and he led the team that pioneered the first true radio detection of aircraft in 1935. In 1938, he became Director of Communications Development in the Royal Aircraft Establishment and a year later was appointed Scientific Adviser (Telecommunications) for the Air Ministry. After the war he became an engineering consultant in Canada and the United States. In 1966 he married Dame Katherine Trefusis-Forbes, the woman who had been the first commander of the Women's Auxiliary Air Force.

BELOW: A photograph of the White Cliffs of Dover taken from a German aircraft during the Battle of Britain. The radar chain towers are clearly visible and in the background smoke can be seen from a bombing raid on Canterbury. The German air forces failed to attack the radar stations heavily or consistently.



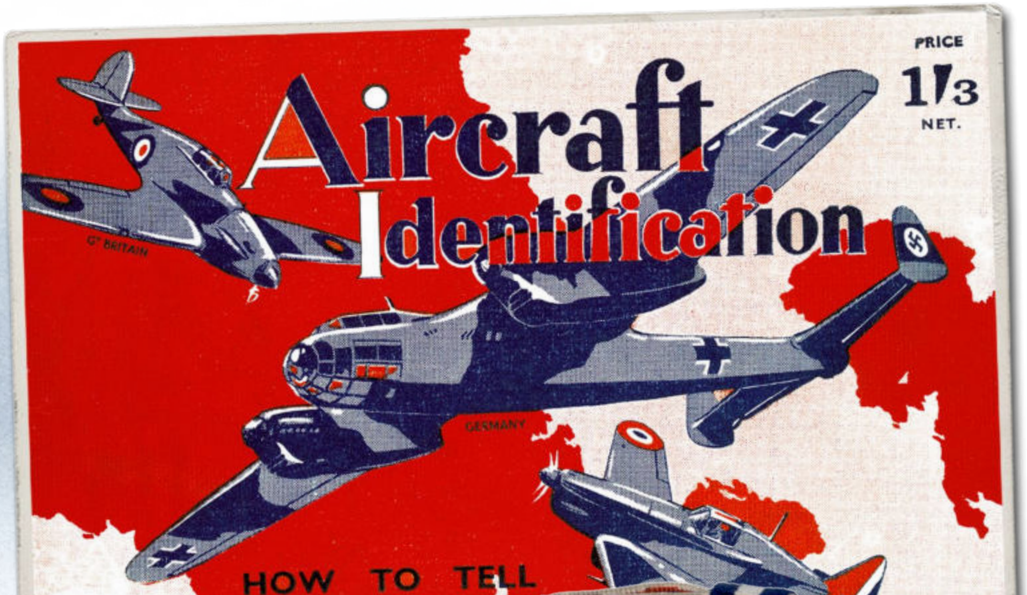
effectively inland, so that Fighter Command was forced to rely on ground observation of aircraft once they had crossed the coast. This was the job of the 30,000 members of the Observer Corps whose posts were supplied with grid maps, a height estimator and a telephone linked directly to the Fighter Command communications network. Although ground observation could supply estimates of height that were widely inaccurate, the general direction of attack could be observed and aircraft scrambled to intercept.

Radar was an important element of the air defence system but it was not entirely reliable. It was possible for height estimations to be wrong, and the time between a sighting and the order to scramble could take a minimum of four minutes while the detected aircraft could be across the English Channel in only six. Improvements in radar technology, important though they were, left some radar stations temporarily inoperable while the new equipment was being installed. Nonetheless, the system worked well enough to permit a reasonable knowledge of the enemy's intentions. The German side never guessed the extent to which radar was integrated into the whole fighter control system and failed to press home attacks on radar stations when these were ordered in mid-August 1940. As a result, the Home Chain continued to supply radar intelligence throughout the battle.



ABOVE: An Observer Corps crew in an observation post during the Battle of Britain. The 30,000 observers were a vital link in the web of detection and communication.

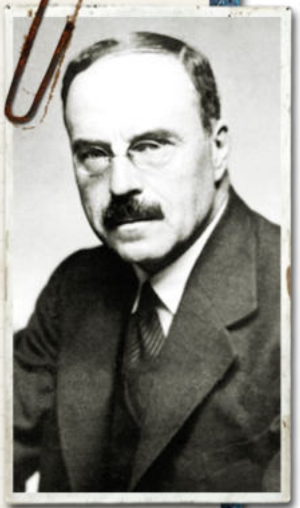
BELOW: The cover of a popular book on aircraft recognition. Books were sold in thousands so that ordinary people could tell friend from foe, but it was easy even for skilled pilots to mistake their own aircraft for the enemy.



OBSERVER CORPS

ABOVE: Observer Corps armband.

SIR HENRY TIZARD (1885-1959)



Henry Tizard wanted a career in the Royal Navy but was prevented by poor eyesight from joining. After studying chemistry and mathematics at Oxford, he began a study of aeronautics. During the First World War he became an officer in the Royal Flying Corps responsible for experimental equipment and ended the war in 1919 as an officer in the RAF. He returned to Oxford but then took a post in the government Department of Scientific and Industrial Research. In 1929, he became rector of Imperial College, London, a post he held until 1942. In 1933, he was appointed chair of the Air Ministry's Aeronautical Research Committee where he played a key role in the development of the British radar defences. Between 1948 and 1952, he was chief scientific adviser to the Ministry of Defence, where he pioneered the serious scientific study of UFOs.

ABOVE: A portrait of Sir Henry Tizard. In 1933 Tizard became chairman of the Aeronautical Research Committee and was a pioneer of operational radar.

ADLERTAG

13 AUGUST 1940

The official start of the campaign to destroy the RAF, codenamed Adlerangriff (Eagle Attack) was supposed to start on 5 August, following Hitler's directive of the first day of that month. The German air force staff decided to wait until 10 August, but poor weather reports brought postponement for a further day. The decision was finally taken to begin the campaign, despite unreliable weather, on 13 August. This was to be Adlertag, Eagle Day.

Following operations against the radar network the previous day, the first wave of attacks began early in the morning. Some 200 German bombers and fighters of Air Fleets 2 and 3 approached on a broad front from bases around Amiens, Dieppe and Cherbourg. They were met in the first instance by 120 fighters, already alerted by radar to the approaching threat. The bombers failed to attack any Fighter Command station, while the inability to supply an effective fighter escort exposed many of them to repeated attacks by British fighters. A further operation around midday was undertaken by Me 110 twin-engined fighters, which arrived over England without the bombers they should have been escorting, flying in a circle to provide each plane with fire cover. The pilots nicknamed the tactic "the circle of death". The force was mauled by squadrons of 10 Group scrambled from Warmwell and Exeter, and a squadron of 11 Group from Tangmere. Five German planes were shot down.

In the afternoon, a second major wave, made up of around 120 aircraft, was sent from Air Fleet 2 against targets in Kent and Air Fleet 3 against the air base at Middle Wallop and other targets in

TOP RIGHT: Barrage balloons on the skyline over London. London was defended by a mixture of balloons, anti-aircraft guns and a network of fighter stations on the fringes of the capital.

RIGHT: A German squadron commander receiving the reports of his squadron crews after returning from a mission over southern England on 13 August 1940. German aircraft flew a total of 1,485 sorties that day and lost 47 aircraft.

BELOW: A group of German officers look across the English Channel at the White Cliffs of Dover. Like Napoleon, this was as far as the German armed forces were to get.

FIELD MARSHAL WOLFRAM VON RICHTHOFEN (1895-1945)

A cousin of the famous "Red Baron", Manfred von Richthofen, Wolfram was commissioned in a German hussar regiment in 1913 before training to fly in 1917. In 1918, he became a pilot in his cousin's squadron. After the war he trained as an engineer and returned to the army in 1923, where he worked in the secret preparation of a new German air force. In 1933 he became chief of the Development Division in the newly formed German Air Ministry, and was promoted in 1936 to lieutenant colonel. He led the Condor Legion sent by Hitler to aid Franco in the Spanish Civil War and was responsible for ordering the notorious air attack on Guernica in April 1937. He also led the German air force unit that attacked Poland first, early on the morning of 1 September. In the Battle of Britain he was commander of the VIII Fliegerkorps, which he continued to lead in the Balkan campaign in 1941 and in the assault on the Soviet Union. He was promoted to field marshal in 1943, but the following year was diagnosed with a brain tumour. He retired from service and died in an American POW camp on 12 July 1945.

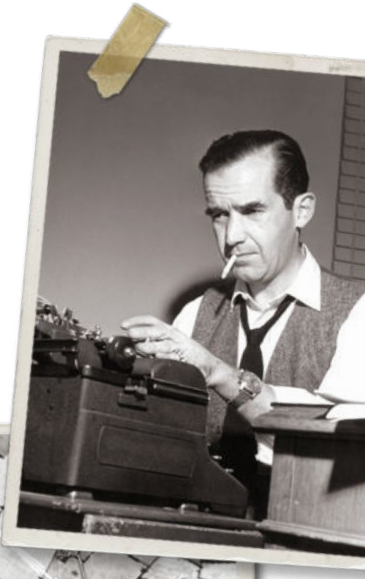
KAMPFGRUPPE 100

On 18 November 1939, two squadrons of German bombers were activated as "pathfinder" units tasked with leading bombers accurately to distant targets. On 13 July 1940, a third squadron was activated. The force was named Kampfgruppe 100 (Bomber Group 100) and received special training in navigating with a new system of radio beams known as X-Gerät. Using four radio beams from different directions, the force was able to arrive over the target with a high level of accuracy. During the Battle of Britain, the unit was commanded by Captain Kurt Aschenbrenner. On the night of 13 August, the group first attacked the large Spitfire factory at Castle Bromwich in Birmingham with 11 bombs, doing little serious damage. Later Kampfgruppe 100 led the major raids against British cities during the Blitz.

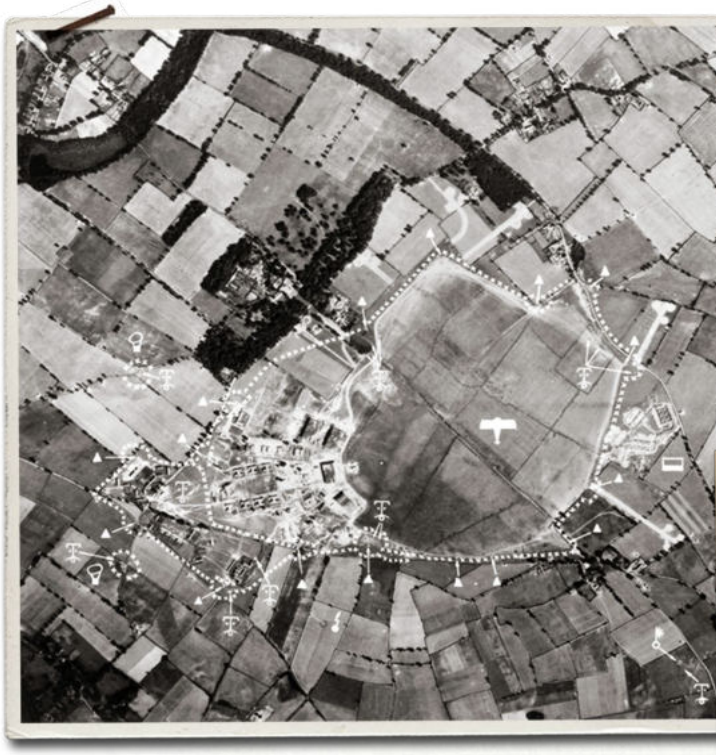
the Southampton area. Warned well in advance, there were squadrons from 10 and 11 Group waiting for the new incursions. The attack on the Southampton area was met by a vigorous counter-attack, but this time the bombers were escorted by a large element of Me 109s and fierce dogfights broke out. The bombers failed to find the Middle Wallop station and scattered their bombs widely over the southern counties in their path. The aircraft from Air Fleet 2 took advantage of cloud cover over Kent, but the bombers only succeeded in attacking a Coastal Command base while others dropped their bombs blind. Over the whole of Eagle Day, no damage was done to Fighter Command stations or to radar installations.

The balance of losses on the first official day of the campaign strongly favoured the defence. The German air force lost 47 aircraft, while Fighter Command lost only 13, with seven pilots saved. The greatest failure exposed that day was the Ju 87 dive-bomber, which was too slow in combat with British fighters. Over the first few days of Eagle Attack some dive-bomber units had 50 per cent losses. On 18 August, they were withdrawn from combat. In the days following Eagle Day, except for 15 August, the weather prevented heavy attacks, but the air fleets continued to probe the British defences. Air Fleet 3 sent over small numbers of unescorted bombers aimed at particular targets, but they faced heavy opposition and found it difficult to locate targets. On 15 August, it was possible to send over a heavy force again and the fighting that day was fiercer than it had been on Eagle Day. That day bombers were also sent against targets in northern England from bases in Norway. The German forces lost 75 aircraft, Fighter Command some 34. A repeat of heavy raids on 18 August produced the fiercest fighting of the battle, with 100 German aircraft lost, for the loss of 74 British fighters.

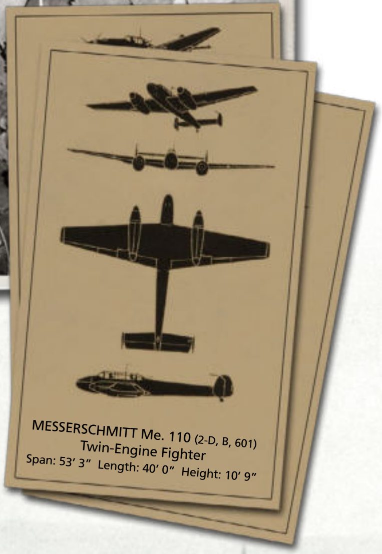
Eagle Day was a disappointment to the German commanders. Both air fleets failed to identify a clear pattern of targets and difficulties encountered in the battle meant that even those targets selected were either subjected to minor damage or not hit at all. Over the following days an effort was made to co-ordinate attacks more effectively and to identify targets that might really undermine the capacity of Fighter Command to maintain its concerted and deadly resistance.

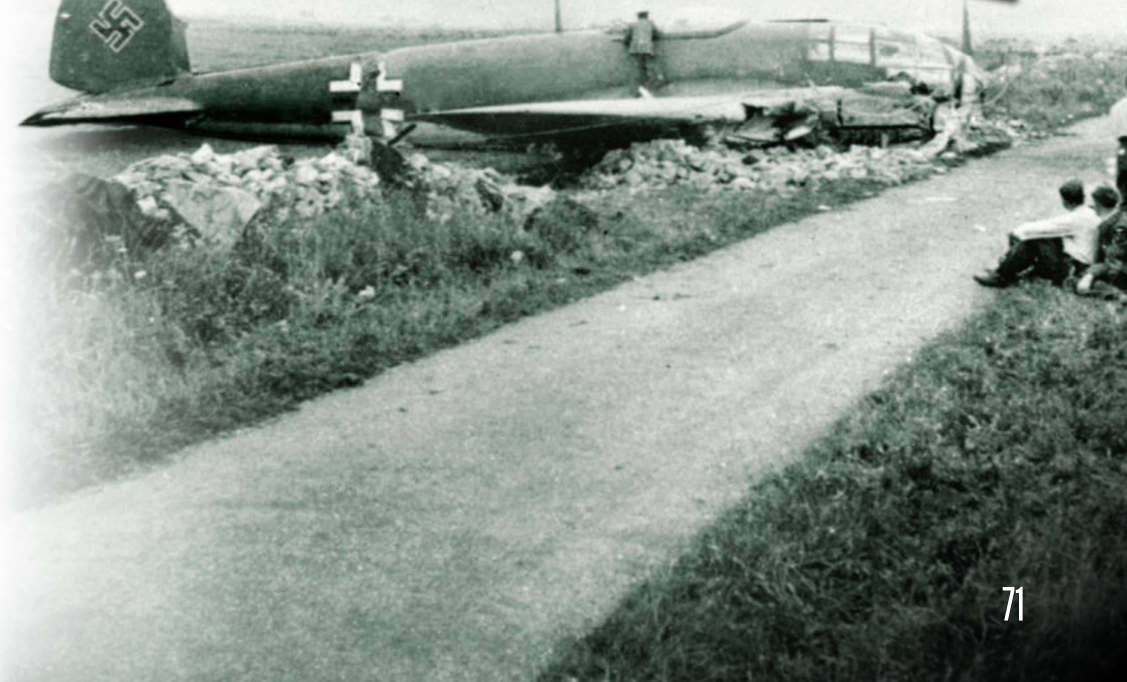


RIGHT: The American journalist Edward R. Murrow at work in London during the battle and the Blitz. The young 32-year old Murrow became a household name in America with his reports of the fighting for CBS Radio. His broadcasts all began with the phrase, "This is London". He stayed throughout the



ABOVE: A German air force reconnaissance photograph of the airbase at Coltishall in Norfolk in 1940. Careful aerial reconnaissance enabled German aircraft to pinpoint their attacks on individual air stations.

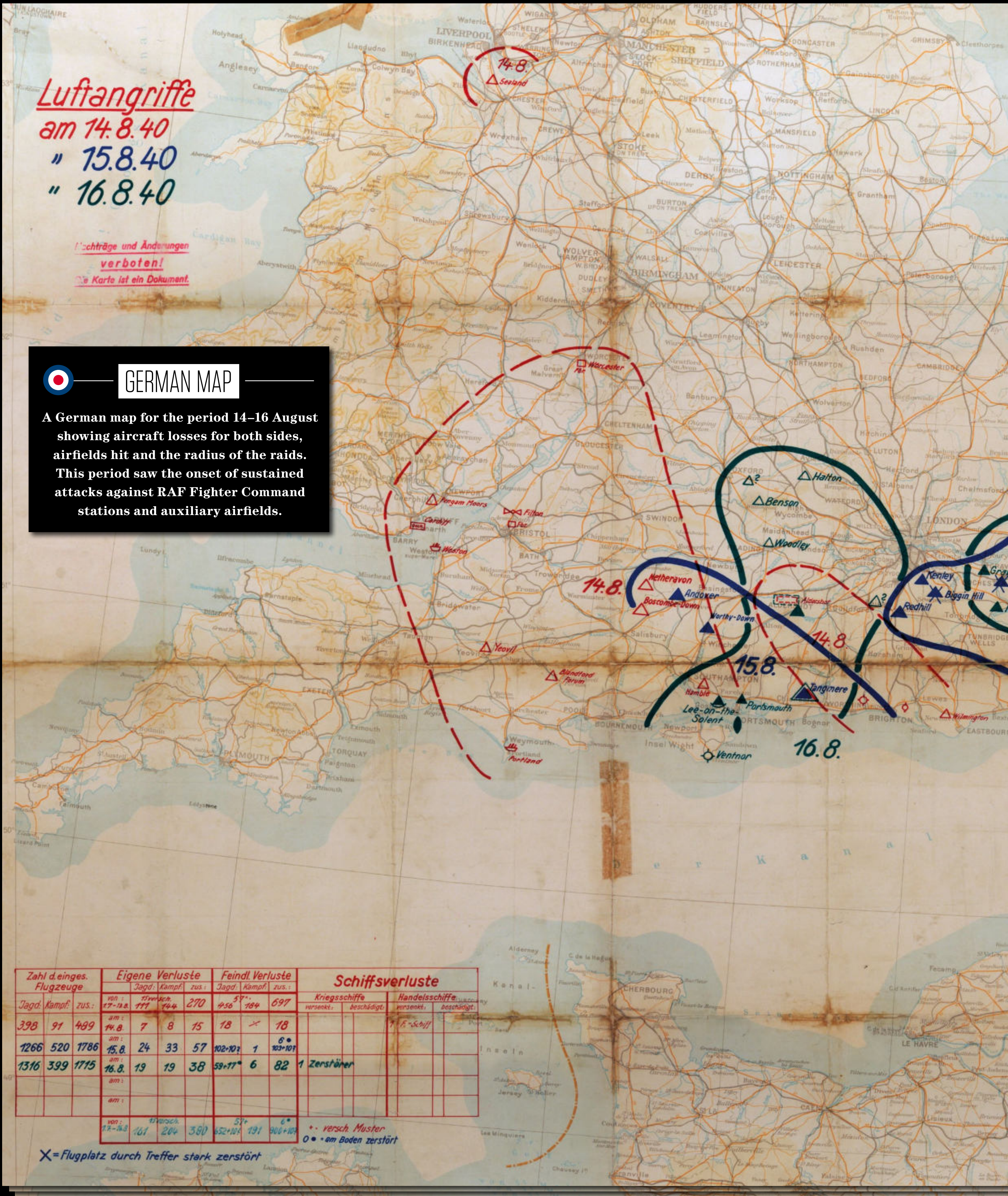

MESSERSCHMITT Me. 110 (2-D, B, 601)
Twin-Engine Fighter
Span: 53' 3" Length: 40' 0" Height: 10' 9"



BELOW: A German Heinkel He 111P medium-bomber shot down at Charterhouse in Somerset by 92 Squadron on 14 Augus. The bombers were no match for the new fast interceptor fighters.

GERMAN MAP

A German map for the period 14–16 August showing aircraft losses for both sides, airfields hit and the radius of the raids. This period saw the onset of sustained attacks against RAF Fighter Command stations and auxiliary airfields.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Andover
Worthy-Down
Aldershot
Halton
Benson
Woodley
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Portsmouth
Tangmere
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Wilmington
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+ · = versch. Muster

○ ● = am Boden zerstört

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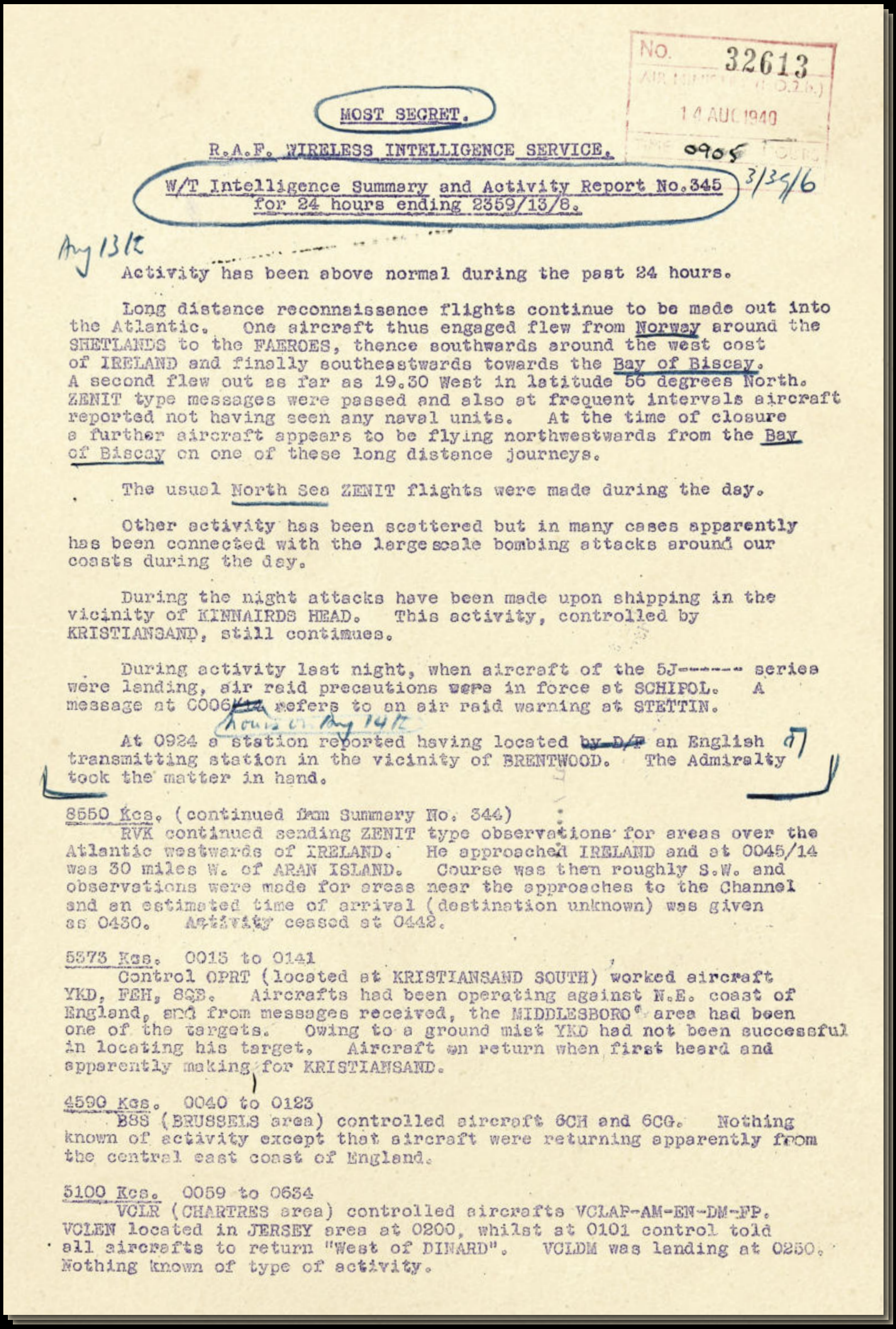
NORWICH
GREAT YARMOUTH
Bury St Edmunds
Martlesham
IPSWICH
Ipswich
Harwich
COLCHESTER
Clacton
15.8.
16.8.
SOUTHEND ON SEA
Sheerness
Gravesend
Eastchurch
Rochester
MAIDSTONE
Maidstone
14.8.
Manston
Ramsgate
Canterbury
Hawkinge
Ashford
DOVER
Lympne
Littlestone
CALAIS
HASTINGS
BOULOGNE
Dieppe
ROUEN
Evreux

ADLERTAG REPORT

An extract from a report from the British Wireless Intelligence Service for "Adlertag" on 13 August 1940. The service was able to intercept a large amount of German wireless traffic, some of which was sent "en clair" without the need for deciphering. This report covers German air activity in the North Sea area.



No. 32613
14 AUG 1940
0905
3/35/6

MOST SECRET.

R.A.F. WIRELESS INTELLIGENCE SERVICE.

W/T Intelligence Summary and Activity Report No.345
for 24 hours ending 2359/13/8.

Aug 13th

Activity has been above normal during the past 24 hours.

Long distance reconnaissance flights continue to be made out into the Atlantic. One aircraft thus engaged flew from Norway around the SHETLANDS to the FAEROES, thence southwards around the west cost of IRELAND and finally southeastwards towards the Bay of Biscay. A second flew out as far as 19.30 West in latitude 56 degrees North. ZENIT type messages were passed and also at frequent intervals aircraft reported not having seen any naval units. At the time of closure a further aircraft appears to be flying northwestwards from the Bay of Biscay on one of these long distance journeys.

The usual North Sea ZENIT flights were made during the day.

Other activity has been scattered but in many cases apparently has been connected with the large scale bombing attacks around our coasts during the day.

During the night attacks have been made upon shipping in the vicinity of KINNAIRDS HEAD. This activity, controlled by KRISTIANSAND, still contimues.

During activity last night, when aircraft of the 5J------ series were landing, air raid precautions were in force at SCHIPOL. A message at 0006~~14~~ refers to an air raid warning at STETTIN.

hours on Aug 14th

At 0924 a station reported having located ~~by D/F~~ an English transmitting station in the vicinity of BRENTWOOD. The Admiralty took the matter in hand.

8550 Kcs. (continued from Summary No. 344)
RVK continued sending ZENIT type observations for areas over the Atlantic westwards of IRELAND. He approached IRELAND and at 0045/14 was 30 miles W. of ARAN ISLAND. Course was then roughly S.W. and observations were made for areas near the approaches to the Channel and an estimated time of arrival (destination unknown) was given as 0430. Activity ceased at 0442.

5373 Kcs. 0015 to 0141
Control OPRT (located at KRISTIANSAND SOUTH) worked aircraft YKD, FEH, 8QB. Aircrafts had been operating against N.E. coast of England, and from messages received, the MIDDLESBORO' area had been one of the targets. Owing to a ground mist YKD had not been successful in locating his target. Aircraft on return when first heard and apparently making for KRISTIANSAND.

4590 Kcs. 0040 to 0123
B8S (BRUSSELS area) controlled aircraft 6CH and 6CG. Nothing known of activity except that aircraft were returning apparently from the central east coast of England.

5100 Kcs. 0059 to 0634
VCLR (CHARTRES area) controlled aircrafts VCLAP-AM-EN-DM-FP. VCLEN located in JERSEY area at 0200, whilst at 0101 control told all aircrafts to return "West of DINARD". VCLDM was landing at 0250. Nothing known of type of activity.

THE ASSAULT ON FIGHTER COMMAND

AUGUST 1940

The assault on Fighter Command which began with "Eagle Day" was supposed to result in the elimination of the RAF's capacity to contest the skies over southern England in four days of intensive operations. The attacks on RAF airfields, radar stations and communications began on 12 August and went on with differing levels of intensity until early September, long after the four days originally assigned to the campaign.

Between 12 August and 6 September, there were 53 main attacks against RAF airfields, though only 32 targeted fighter stations. There were also a great many smaller attacks which were designed to keep up the pressure on the RAF's organization, which the German air force later calculated at a figure of 1,000 raids. All but two of the attacks against the fighter bases were made against Park's 11 Group in the south-east of England. The scale of the attacks was at times limited by the weather, but also by the degree of resistance shown by Fighter Command in the endless dogfights that developed between the two sides over the three weeks of the campaign.

The assault began on 12 August with six major raids against radar stations. These achieved very little, partly because Fighter Command had organized subsidiary facilities in case a Home Chain station was temporarily out of operation. After this, raids against radar stations were few in number, since the German side assumed that they were difficult targets to destroy and, moreover, understood little of the integrated nature of the Fighter Command early warning system. From 13 August, the fighter stations and subsidiary airfields became the main battleground. Low-flying German aircraft attempted to destroy British aircraft on the ground, as they had done in Poland and France, but although 56 were destroyed in total, this occurred mainly at the start of the battle. Fighter bases were ordered to disperse and camouflage all aircraft, and a network of subsidiary airfields made it possible to avoid easy detection and to continue flying if a major air station was briefly made inoperable.

By 20 August, it was evident that the order to eliminate the RAF in four days had failed. German attacks began to move further inland against more distant RAF targets, while Goering ordered the final destruction of the RAF with "ceaseless attacks" by day and night against military and industrial targets. Every few days, German air intelligence assured Goering that the battle was almost won. At the end of the month he was told that Fighter Command had lost 791 aircraft against a German loss of only 169. In reality, the losses were more or less even: 444 RAF fighters between 6 August and 2 September; 443 German fighters

AIR VICE-MARSHAL QUINTIN BRAND (1893-1968)

Quintin Brand, the son of a South African policeman, moved to Britain in 1915 to join the Royal Flying Corps. After serving on the Western Front, he commanded one of the first night-fighter squadrons in Britain in 1918. He remained in the RAF and was knighted in 1920 for an attempted record flight from London to Cape Town. He worked at the Royal Aircraft Establishment in the 1920s, and was Director-General of Aviation in Egypt from 1932 to 1936. He became commander of 10 Group, Fighter Command, when it was activated in 1940 and played an important part in the defence of southern England in 1940. He retired from the RAF in 1943 and moved to Southern Rhodesia (Zimbabwe) in 1952.

ABOVE: When the approach of enemy planes was reported, RAF squadrons were "scrambled" to intercept them. Here pilots run towards their waiting Hurricanes.

RIGHT: German Junkers Ju 87B dive-bombers flying over the English coast during the Battle of Britain. The dive-bombers were used to attack convoys and shipping as well as RAF installations but they took such high casualties that they were withdrawn from the battle.

GERMAN AIR INTELLIGENCE

One of the great failures in the Battle of Britain was the German air intelligence organization. It was led during the Battle of Britain by Colonel Josef "Beppo" Schmid. The reports produced by his staff about the strength, deployment and operation of Fighter Command, and about the levels of British aircraft production played an important part in encouraging wildly exaggerated expectations about the defeat of the RAF. On 7 August, Air Intelligence reported that the radar stations would tie British squadrons closely to their local airfields and prevent any concentration of effort. Schmid failed to grasp the nature of the link between radar, observation and operations and so underestimated the capacity of Fighter Command to intercept German attacks. Thanks to a stream of poor intelligence provided by German secret agent "Ostro", British aircraft production was estimated at only half its true volume. In early September, Schmid relayed to Goering the news that Fighter Command had been reduced at one point to only 100 serviceable aircraft when the true figure was six times as great.

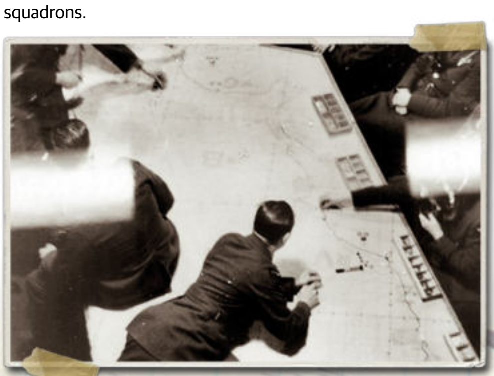
between 8 and 31 August. Total German losses for that period amounted to a little under 900 aircraft of all types. By the end of August, the cumulative strain on both air forces from three weeks of continuous attritional warfare was profound.

The success of Fighter Command in withstanding the assault on its organization was due to a number of factors. Much of the German effort was devoted to air bases near the Kent and Sussex coasts, particularly Lympne, Manston and Hawkinge, each of which was out of commission for only a few days during the battle. These were regarded by Park and Dowding as emergency fields, while vulnerable aircraft could be pulled back to airfields further inland. Because of the early warning system, the withdrawal of aircraft made little difference to the ability to intercept bombers. Park could also call on the more distant fighter squadrons of 12 and 10 Groups to support his own activities, and on a supply of pilots from other parts of the country who replaced tired and battered squadrons at key points in the contest. Park ordered standing patrovls at low level to prevent a surprise bombing attack while Hurricanes were ordered to concentrate on destroying the bombers, since they were responsible for the damage on the ground. Meanwhile, the higher performance Spitfires engaged enemy fighters.

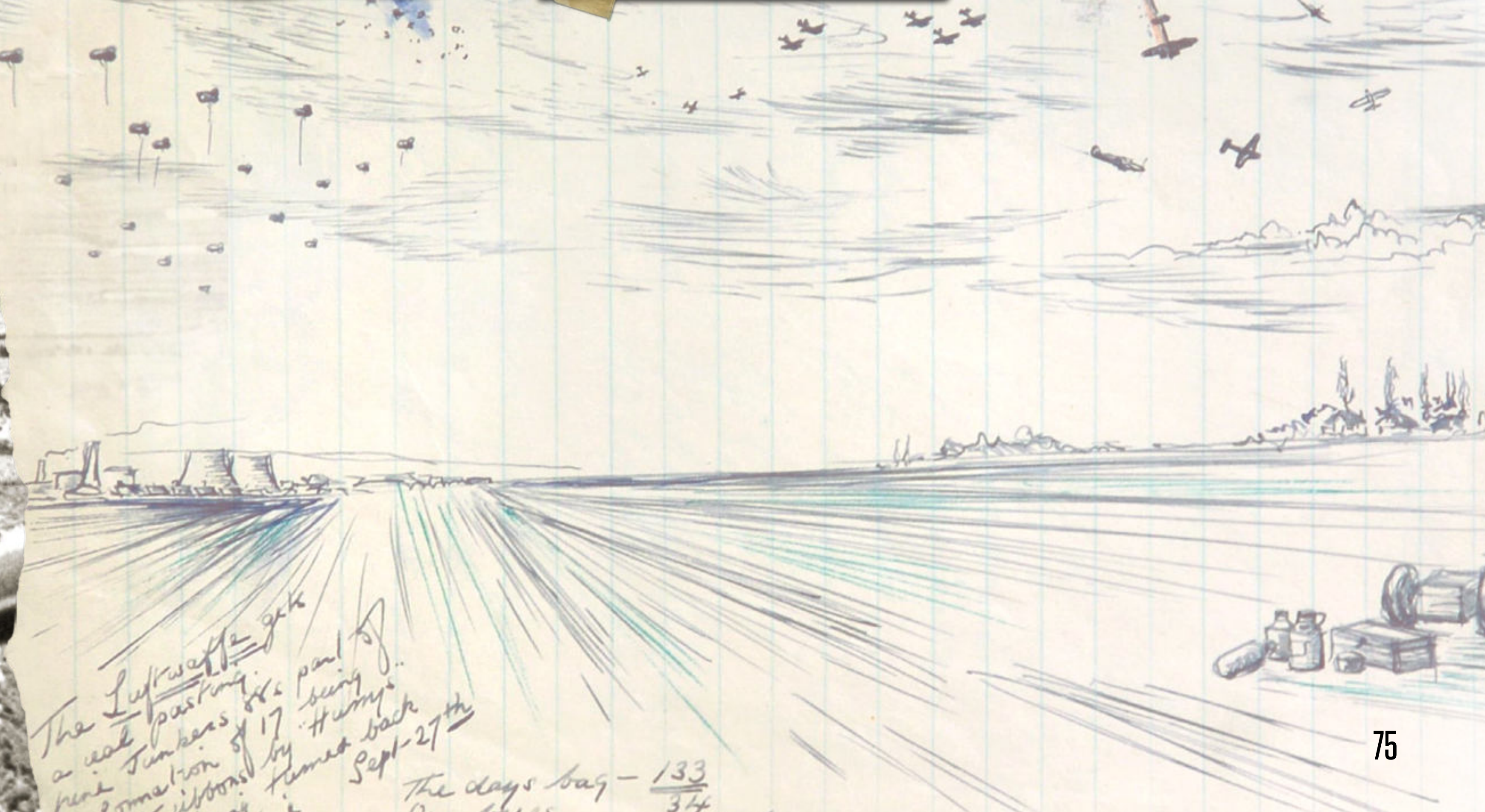
The German force reacted to these tactical changes by withdrawing the vulnerable Ju 87 dive-bombers and the Me 110 twin-engined fighters, both of which had suffered high casualties, and by trying to lure Fighter Command aircraft into unequal battles further out over the English Channel. But there was little that the German side could do to undermine the British communications system, while the high toll on both fighters and bombers led to a sharp decline in the number of serviceable aircraft and to a shortage of skilled pilots. By early September, despite the largely exaggerated estimates of British losses made on the German side, it was evident to all that the Eagle Day campaign had failed to achieve its objectives.

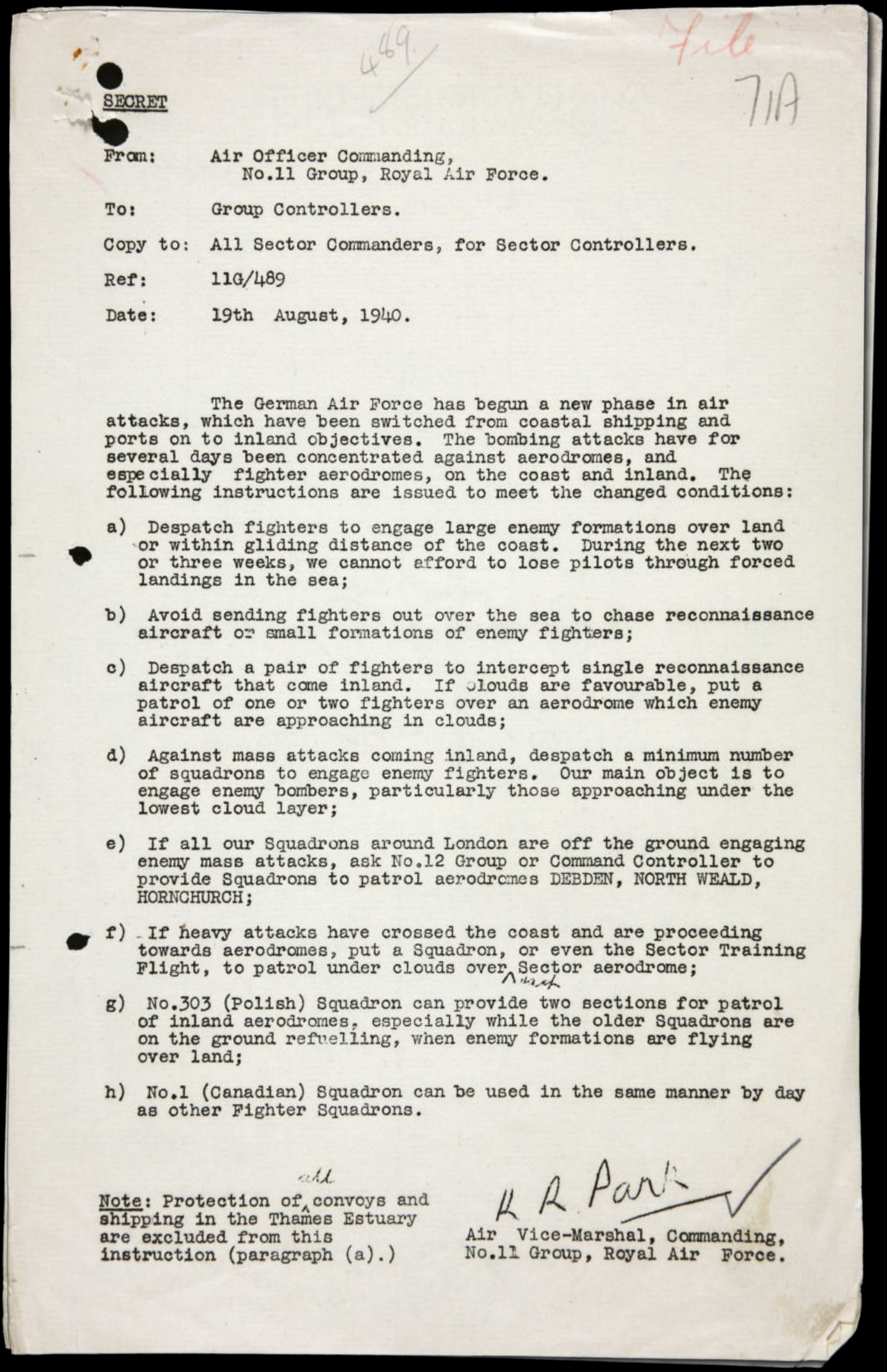
ABOVE LEFT: German air intelligence officers scrutinize images taken during the Battle of Britain.

BELOW: A view looking down on the filter room at Fighter Command headquarters where the information was collected from radar and observers, and then fed back to the frontline squadrons.



BACKGROUND: A sketch of the aerial battle over an airfield in south-east England drawn by Fred Goodwin, a member of RAF ground crew in summer 1940. He kept a record in pictures of his experience during the war.





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File

71A

SECRET

From: Air Officer Commanding,
No.11 Group, Royal Air Force.

To: Group Controllers.

Copy to: All Sector Commanders, for Sector Controllers.

Ref: 11G/489

Date: 19th August, 1940.

The German Air Force has begun a new phase in air attacks, which have been switched from coastal shipping and ports on to inland objectives. The bombing attacks have for several days been concentrated against aerodromes, and especially fighter aerodromes, on the coast and inland. The following instructions are issued to meet the changed conditions:

a) Despatch fighters to engage large enemy formations over land or within gliding distance of the coast. During the next two or three weeks, we cannot afford to lose pilots through forced landings in the sea;

b) Avoid sending fighters out over the sea to chase reconnaissance aircraft or small formations of enemy fighters;

c) Despatch a pair of fighters to intercept single reconnaissance aircraft that come inland. If clouds are favourable, put a patrol of one or two fighters over an aerodrome which enemy aircraft are approaching in clouds;

d) Against mass attacks coming inland, despatch a minimum number of squadrons to engage enemy fighters. Our main object is to engage enemy bombers, particularly those approaching under the lowest cloud layer;

e) If all our Squadrons around London are off the ground engaging enemy mass attacks, ask No.12 Group or Command Controller to provide Squadrons to patrol aerodromes DEBDEN, NORTH WEALD, HORNCHURCH;

f) If heavy attacks have crossed the coast and are proceeding towards aerodromes, put a Squadron, or even the Sector Training Flight, to patrol under clouds over each Sector aerodrome;

g) No.303 (Polish) Squadron can provide two sections for patrol of inland aerodromes, especially while the older Squadrons are on the ground refuelling, when enemy formations are flying over land;

h) No.1 (Canadian) Squadron can be used in the same manner by day as other Fighter Squadrons.

Note: Protection of all convoys and shipping in the Thames Estuary are excluded from this instruction (paragraph (a).)

K R Park

Air Vice-Marshal, Commanding,
No.11 Group, Royal Air Force.

AIR DOCUMENT

Air Vice-Marshall Keith Park's letter to all group controllers with details of changed tactics in response to the German attacks on fighter stations in mid-August 1940. The requests to 12 Group to patrol and protect airfields north of London were not always complied with.

ALLIES IN FIGHTER COMMAND

Airmen in Canada boarding the train in Ottawa at the start of their long journey across the Atlantic in order to assist their allies in the battle. Thousands of Canadians flew in Fighter and Bomber Commands.

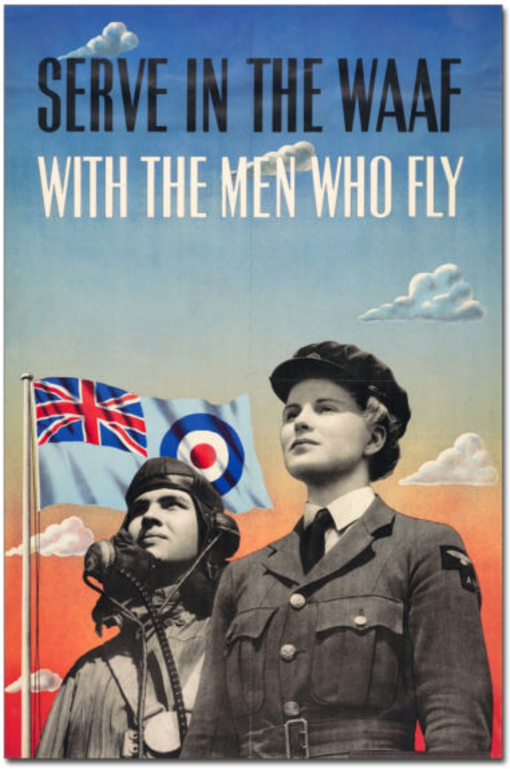
WOMEN IN THE BATTLE OF BRITAIN

Women played an important though often neglected part in the Battle of Britain, not only as volunteer members of the Women's Auxiliary Air Force (created in 1939), but also as members of the Women's Voluntary Service formed in 1938 to offer welfare help during future bombing raids. Women were also well represented in the workforce of the rapidly expanding armaments and aviation industries. They were not allowed to fly in combat, but they ran all the risks that servicemen did if they were based at airfields or in operations rooms.

During the bombing, women helpers were exposed to the same dangers faced by the male civil defence personnel. There had briefly been a Women's Royal Air Force in 1918–20. On 28 June 1939, a new service was created out of 47 RAF companies in the Auxiliary Territorial Service (formed in 1938). It was called the Women's Auxiliary Air Force and its members became usually known by the acronym "WAAFs". In September 1939, there were 1,700 members, but by 1943, after conscription had been introduced, there were 175,000. A table of ranks was introduced in December 1939 equivalent to male ranks, but women were paid only two-thirds of the amount paid to men.

The Auxiliary Air Force performed a wide variety of support roles for the RAF. They acted as drivers, clerks, telephonists and a host of other service jobs. Their most famous role was during the Battle of Britain when WAAFs could be found at radar stations and in operations rooms helping to plot attacking aircraft and direct the fighters to intercept them. But they also had an important role in interpreting aerial reconnaissance photographs and in other areas of air intelligence. There was also a separate RAF Nursing Service, though female doctors were integrated into the ranks of the RAF medical services. Later in the war, German women performed many of the same duties as auxiliaries in the German air force.

In June 1938, a second all-female organization was established to cope with the expected threat of air attack. The Women's Voluntary Service for Air Raid Precaution was founded in June 1938 under the auspices of Lady Reading, a volunteer nurse in the First World War and widow of a former Viceroy of India. Its members, recruited countrywide, had a distinctive uniform of green tweed jackets and matching hats. In January 1939, the name was changed to Women's Voluntary Service for Civil Defence to reflect the wide range of roles that women were expected to undertake in a bombing war. The motto of the service was, "The WVS never says no!" The members' functions were chiefly concerned with post-raid welfare, though an


SERVE IN THE WAAF
WITH THE MEN WHO FLY

ABOVE: A famous image from the early years of war shows an RAF pilot and a WAAF standing side-by-side. The first women's air force had existed at the end of the First World War but was closed down. The WAAF was founded again in June 1939.

ABOVE: Fighter Command Operations Room in which the WAAFs had a key role to play in collecting and collating information and making sure the plot maps were kept entirely up to date.

ABOVE: Members of the WAAF pack parachutes to be used by pilots when they have to bail out of their aircraft mid-flight.

DAME KATHERINE TREFUSIS-FORBES (1899-1971)

The first commander of the Women's Auxiliary Air Force in the Second World War was Katherine Trefusis-Forbes, a redoubtable woman who ran a kennel business until she volunteered for emergency service work in 1935. She had been a member of the Women's Volunteer Reserve during the First World War and achieved the rank of second lieutenant. In 1939, she played a key part in organizing the support role of women in the RAF, rising to the rank of air chief commandant by October 1943, when she was succeeded by Mary Welsh. She promoted women's services abroad from 1943 and returned to civilian life in 1945. In 1966, she married Robert Watson-Watt, the pioneer of British radar.

important part of their work early in the war was to help administer the vast evacuation of mothers and children from the threatened cities and to place evacuees with families in the reception areas.

With the onset of heavy bombing, the WVS helped to collect clothes and equipment to help bombed-out families and to provide temporary accommodation for those whose homes had been destroyed. They also manned rest centres in or near air raid shelters, and organized mobile canteens for men posted to distant air stations and observation points. Women were to be found providing direct support to the main civil defence branches: air raid precaution (ARP), the fire service, the ambulance service and public transport.

Not all women accepted that war was necessary or that bombing could not be resisted by different means. The pacifist writer Vera Brittain, who had also been a nurse during the First World War, became a spokesman in 1937 for the pacifist Peace Pledge Union and during 1940 could be found at demonstrations against war in general and against bombing as an instrument of war in particular. Her “Letters to Peace Lovers” were published every fortnight during 1940, distributed to pacifists all over the country. In 1941, during the Blitz, she helped to found a Bombing Restrictions Committee which campaigned for the RAF not to retaliate in kind for German attacks. Though always a small minority, women pacifists helped to give voice to many of the anxieties felt by other women as they came to terms with the demands of total war.

ABOVE: A young girl is rescued from a bombed building by a female ARP warden during the bombing of London in 1940. Women civil defence workers played a large part in the rescue and rehabilitation of bomb victims.

WAR WORK FOR WOMEN

During the early stages of the war, women workers were recruited to fill the jobs vacated by men as a result of conscription. Even before the war, around a quarter of the British workforce was female, but it proved necessary to move many of them from inessential industries to work with armaments. The proportion of women workers in the motor and aircraft industries rose from nine per cent in 1939 to 23 per cent two years later, and eventually to over 36 per cent in 1943–44. Women were generally paid at a much lower rate than men, and their work often classified as unskilled even when they performed similar functions to men. In 1940, new wage rates were negotiated but they were still well below male levels, and led to considerable complaint among the growing army of women employed in armaments, who were essential for keeping British war production going.

ABOVE: Female workers in a Supermarine Spitfire factory in April 1941.

BELOW: The commander of the women’s section of the Air Transport Auxiliary (ATA), Pauline Gower, with a group of female pilots and staff from No. 5 Ferry Pilots Pool based at Hatfield, Berkshire. Women began ferrying aircraft in 1939 and eventually 166 served with the ATA, 15 of them losing their lives.

KROLL OPERA HOUSE

Hitler makes his historic address at the Kroll Opera House on 19 July 1940. He suggested here that Germany make a "peace offer" to Britain. Behind Hitler sits Herman Goering, president of the Reichstag.

BIGGIN HILL

30 AUGUST 1940

Biggin Hill in Kent was perhaps the most famous of all the RAF fighter bases during the Battle of Britain. By the end of November, when two Spitfires shot down an Me 109 over the Channel, the station claimed 600 enemy aircraft destroyed. The aces who flew from Biggin Hill included Max Aitken (son of Lord Beaverbrook and a member of the "Millionaires' Squadron"), "Sailor" Malan and John Mungo-Park. The most remarkable thing about Biggin Hill was the fact that it continued to act as a fighter station even when almost all its buildings had been destroyed in air attacks in late August 1940.

The airfield had begun life in January 1917 during the First World War when the Royal Flying Corps established a Wireless Testing Park there. During the interwar years it remained a site for testing RAF equipment, with an emphasis on radio communication. At the start of the war in September 1939, the station was home to two Hurricane squadrons, including 32 Squadron, which had been based there since 1932, and a squadron of twin-engined Blenheims. With the onset of the Battle of Britain, Biggin Hill found itself in the frontline of 11 Group airfields, a natural target for the German air force in the "Eagle Attack" of August 1940. During the course of the battle the station was home to a total of six squadrons, though the system of rotating squadrons to safer airfields for rest meant that there were seldom more than two squadrons operational at any one time.

The fighters from Biggin Hill formed part of the defensive ring around Kent and Sussex. They were used to attacking incoming aircraft often far from their base. The defence of their own station only began with an opening attack on 12 August, the day before "Eagle Day". The bombers attacked generally in small groups, often from low level, and were difficult to intercept or divert. The first attacks did limited damage, but the attacks on 15 and 18 August and two final devastating attacks on 30 August destroyed almost every building standing on the base. There was scant protection provided for the staff of the base but the number of dead was small except for the major attack on 30 August. Thirty-nine people were killed and 24 injured, including the only death among the almost 200 members of the Women's Auxiliary Air Force stationed at Biggin Hill. The exceptional heroism displayed by the WAAFs at Biggin Hill brought three of their number the award of the Military Medal. Only three more of these medals were awarded to WAAFs throughout the whole of the war.

Fighter Command had anticipated attacks against its airfields and mobile squads of labourers were directed to repair damage to the runways so

BELOW: A group of pilots from 79 Squadron at Biggin Hill in July 1940. The Hurricane squadron was posted north to recuperate and returned to Biggin Hill, the only squadron still to be operating from the battered station. On 8 September the squadron was posted away for a further rest.

BELOW: Entrants in their competing planes line up for the start of one of the Grosvenor Cup races at Lympne in the 1930s.

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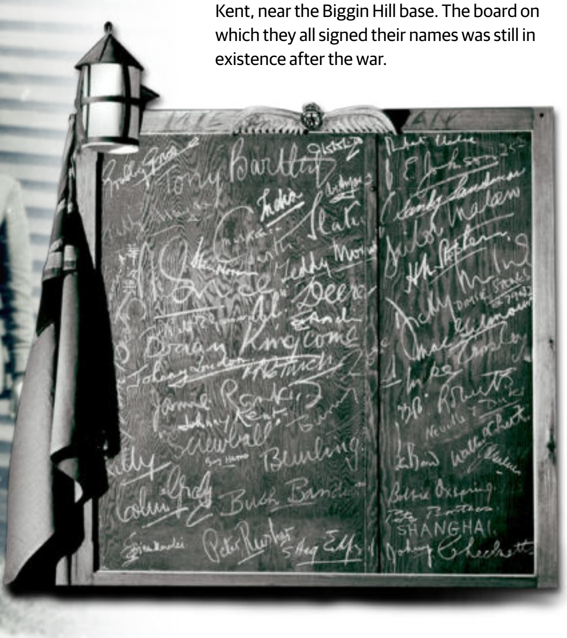
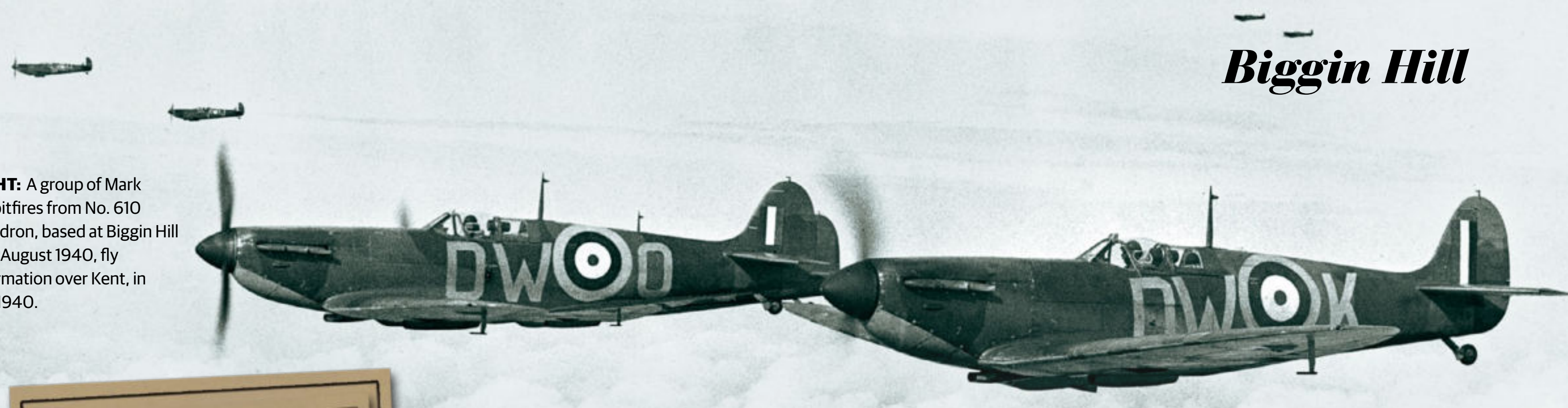
LYMPNE AIRPORT

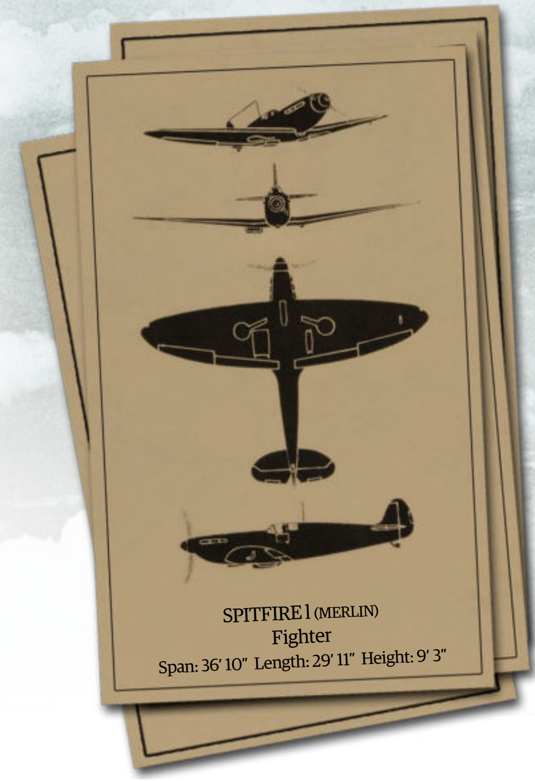
The airport at Lympne in Kent, founded in 1916 as an emergency landing ground for Royal Flying Corps aircraft, played an important part during the Battle of Britain acting in a similar role for aircraft from the fighter stations in Kent and Sussex. Lympne became a civil airport in the interwar years, host to airmail aircraft and, from 1923, annual air races. The final race staged before the war was on 5 August 1939, by which time it had been requisitioned by the Royal Navy Fleet Air Arm. Though not a fighter station, it was heavily bombed on 15 August and temporarily put out of action. A raid on 30 August killed five local workmen. Fighters landed there only to refuel or in emergencies. Later in the war, Spitfires and Typhoons were stationed at Lympne for the war in Europe. Civil flying and racing was restored in 1946, but the airport finally ceased commercial flying in 1974.

BELOW: The pilots stationed at Biggin Hill would relax in the White Hart pub in Brasted, Kent, near the Biggin Hill base. The board on which they all signed their names was still in existence after the war.

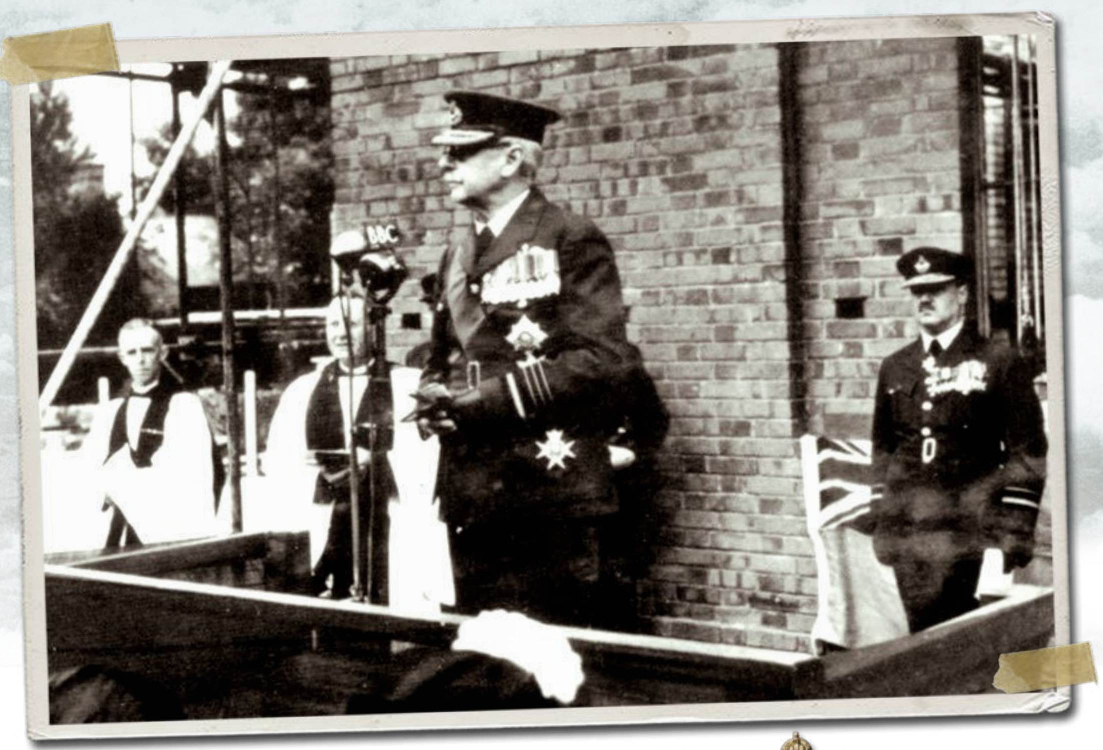




RIGHT: A group of Mark 1A Spitfires from No. 610 Squadron, based at Biggin Hill July–August 1940, fly in formation over Kent, in July 1940.



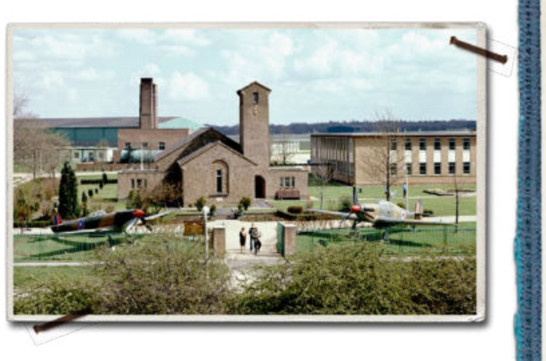
ABOVE: Spitfire spotter card.



ABOVE: A visit to Biggin Hill by Lord Dowding, the former commander-in-chief of Fighter Command, in July 1951 to lay the foundation stone of the Biggin Hill Chapel, pictured below.

RIGHT: A German air force reconnaissance photograph of Manston airfield taken during the battle.

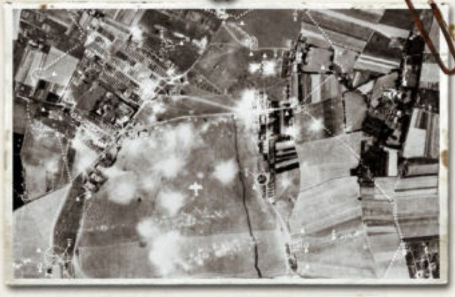
BELOW: Spitfire and Hurricane replicas outside the RAF chapel at the Biggin Hill air base in 1966.



that aircraft could continue to fly. The operations room was destroyed in one raid but an emergency operations room was set up in a local village shop so that the flow of information about incoming aircraft and instructions to the pilots could be maintained. The station staff and the pilots were housed in villages around the air base to avoid casualties, and every effort was made to conceal or camouflage the aircraft, remarkably few of which were ever destroyed on the ground.

During September, the heavy raids suddenly ceased with the switch to the bombing of London. In mid-September, a squadron of night fighters was posted to Biggin Hill to meet the challenge of German night bombing, but after three days it was transferred to Gatwick because of the difficulty of organizing two different sets of operations from the same base. During September and October, the fighters at Biggin Hill continued to challenge the raids on London. So destroyed was the air base that there was little left for the enemy to attack, but it remained operational, the hub of an effective organization dispersed around the surrounding Kent countryside. In October and November, 92 Squadron and 74 Squadron, the latter commanded by "Sailor" Malan, engaged in regular dogfights with high-flying German intruders. On 30 November, two Spitfires took off without orders to try to shoot down the station's 600th enemy aircraft. A group of eight Me 109s was spotted near Deal and a straggler destroyed by the two Spitfires.

After the war, Biggin Hill was used by RAF Transport Command, but then again became a regular fighter base. In 1958, the station was closed, leaving an RAF Officer and Aircrew Selection Centre. This, too, was abandoned in 1992 and Biggin Hill became a fully civilian airport and the host for regular air shows.

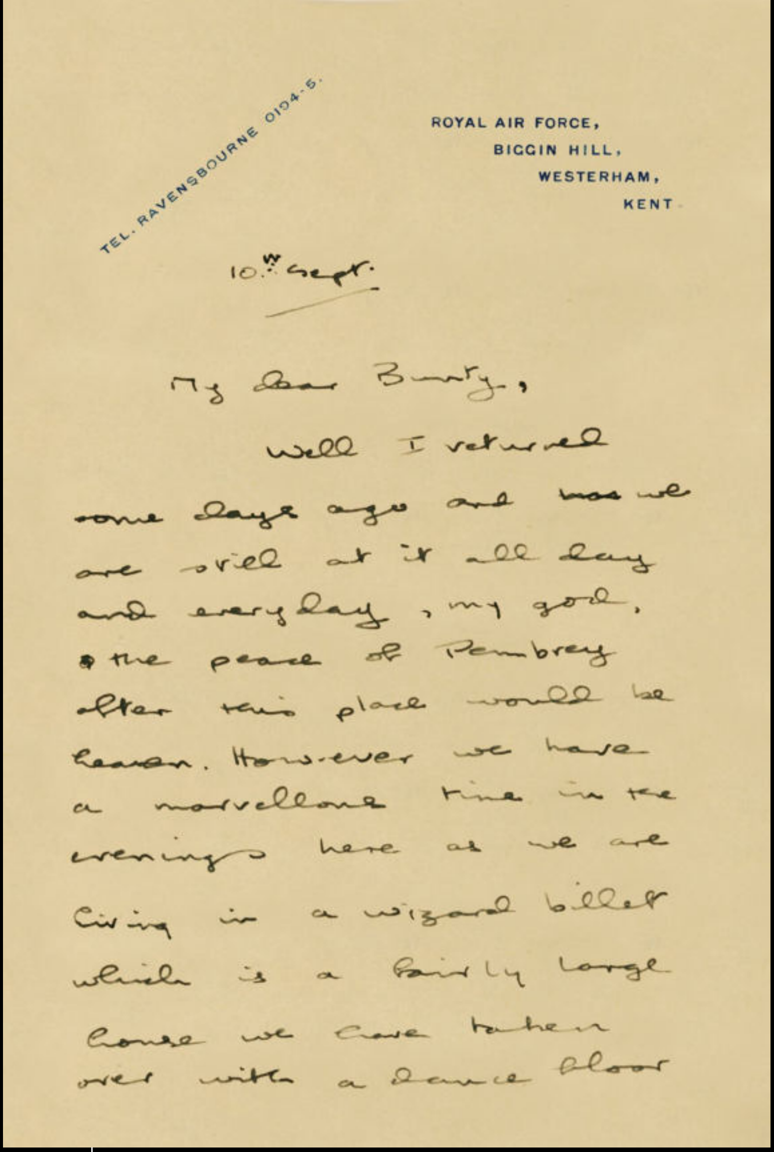


RAF MANSTON

Manston, situated on the Isle of Thanet in Kent, was an RFC and RAF station from 1916 to 1999. It was the most heavily attacked air base during the Battle of Britain and was rendered unserviceable for six days and five nights between 14 August and 12 September, despite strenuous efforts by large mobile teams of workmen organized by the Air Ministry. Manston began life as an Admiralty aerodrome in 1915–16, but then became home to Royal Flying Corps aircraft defending against Zeppelins and Gotha bombers. At the start of the Second World War, it was a major Fighter Command base for 11 Group. Later in the war the airfield was used by aircraft testing Barnes Wallis's "bouncing bomb" and subsequently the first squadron of RAF Meteor jet fighters was based there. After the war, Manston was taken over by the United States air force as a base, but in 1961 the base returned to RAF use until its closure in 1999. It is now Kent International Airport.

LETTER TO BUNTY

A letter to Section Officer D.J.G. "Bunty" Nash from Robert Holland, a pilot with 92 Squadron stationed at Biggin Hill during early September 1940. He writes with enthusiasm that the house he was stationed in was a "wizard billet".



TEL. RAVENSBOURNE 0194-5.

ROYAL AIR FORCE,
BIGGIN HILL,
WESTERHAM,
KENT.

10th Sept.

My dear Bunty,

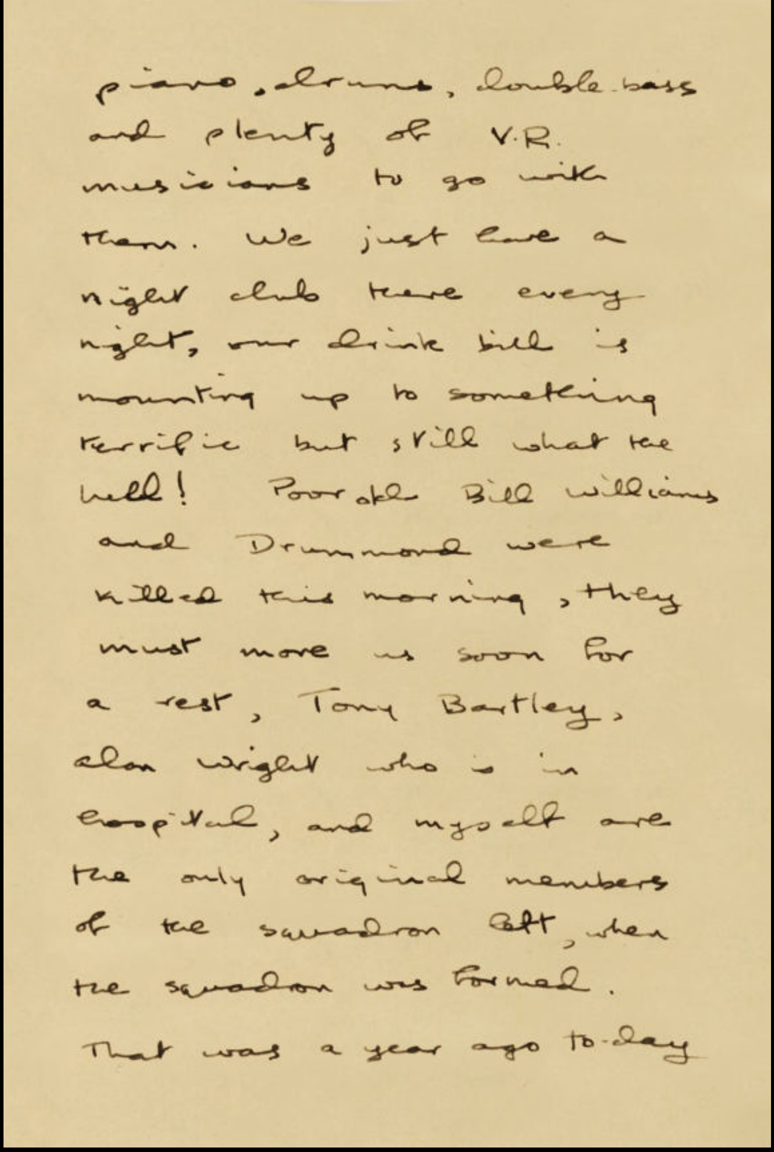
Well I returned some days ago and was we are still at it all day and everyday, my god, the peace of Pembrey after this place would be heaven. How-ever we have a marvellous time in the evenings here as we are living in a wizard billet which is a fairly large house we have taken over with a dance floor

MY DEAR BUNTY

Well I returned some days ago and we are... at it all day and every day, my God, the peace of Pembrey after this place would be heaven.

SQUADRON CASUALTIES

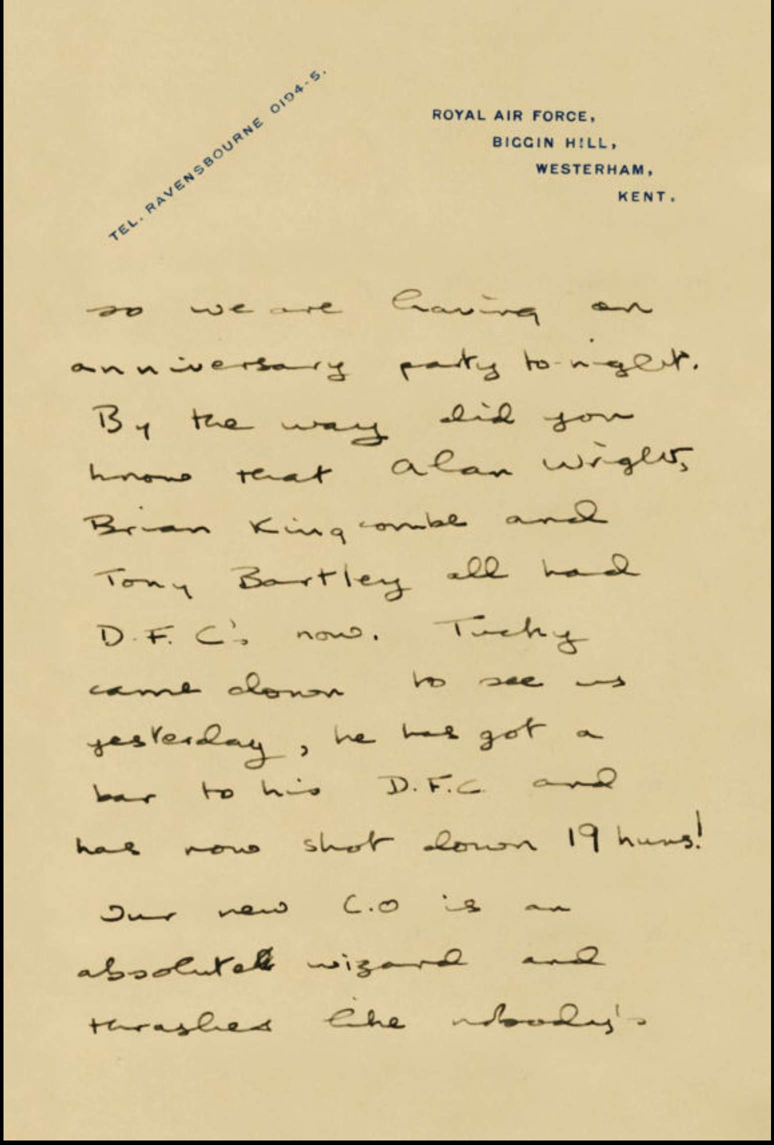
Poor old Bill Williams and Drummond were killed this morning, they must move us soon for a rest, Tony Bartley, Alan Wright and myself are the only original members of the Squadron left...



piano, drums, double-bass and plenty of V.R. musicians to go with them. We just have a night club there every night, our drink bill is mounting up to something terrific but still what the hell! Poor old Bill Williams and Drummond were killed this morning, they must move us soon for a rest, Tony Bartley, Alan Wright who is in hospital, and myself are the only original members of the squadron left, when the squadron was formed. That was a year ago to-day

ANNIVERSARY PARTY

So we are having an anniversary party to-night. By the way did you know that Alan Wright, Bring Kingcombe and Tony Bartley all had D.F.C.'s (Distinguished Flying Crosses).



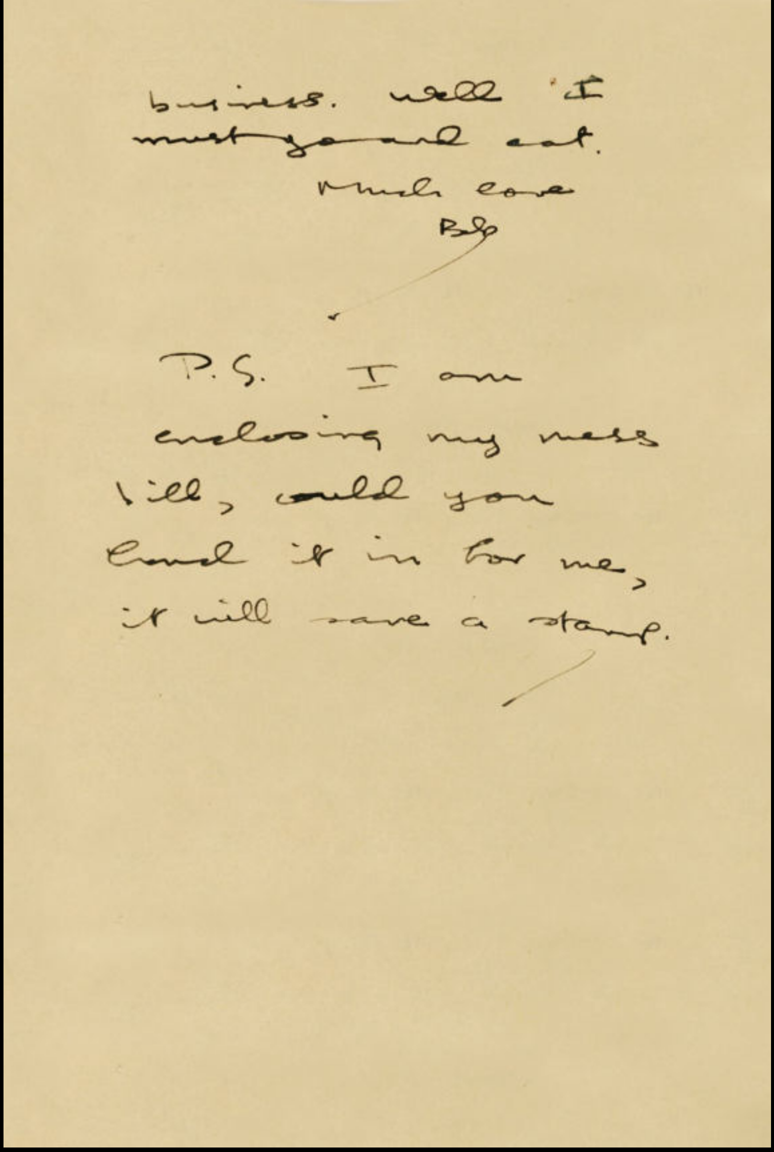
TEL. RAVENSBOURNE 0194-5.

ROYAL AIR FORCE,
BIGGIN HILL,
WESTERHAM,
KENT.

so we are having an
anniversary party to-night.
By the way did you
know that alan wright,
Brian Kingcombe and
Tony Bartley all had
D.F.C's now. Tuchy
came down to see us
yesterday, he has got a
bar to his D.F.C and
has now shot down 19 huns!
Our new C.O is an
absolutely wizard and
thrashes like nobody's

A FAVOUR TO ASK

P.S. I am enclosing my mess bill, could you hand it in for me, it will save a stamp.



business. well I
must go and eat.
Much love
Bob

P.S. I am
enclosing my mess
bill, could you
hand it in for me,
it will save a stamp.

THE OTHER BATTLE

AIR WAR IN NORTHERN BRITAIN

LIEUTENANT GENERAL HANS-JÜRGEN STUMPFF (1889-1968)

The commander chosen to lead the Norway-based Air Fleet 5 for attacks on British ports and shipping was a former Prussian army officer, Hans-Jürgen Stumpff. He was commissioned in the army in 1907 and served as a staff officer during the First World War. He stayed on in the small peacetime army and as a lieutenant colonel was made head of personnel in the secret German air force in 1933. He became air force chief of staff in 1937 in succession to Albert Kesselring. He held the post until January 1939 after which he held combat commands, first of Air Fleet 5, based in Scandinavia, then, from January 1944, as commander of the home defence of the Reich against the Combined Bomber Offensive. He was one of the three German signatories of the unconditional surrender of May 8 1945 in Berlin. Captured by the British, he was released in 1947.

ABOVE: A photgraphic portrait of Lieutenant General Hans-Jürgen Stumpff, who led attacks on British ports and shipping.

The Battle of Britain is often thought of as a campaign fought out in what was called "Hell's Corner" in the south-eastern counties of Kent and Sussex. However, the air battles were also fought over other parts of the country and particularly along the British North Sea coastline where ports and shipping were targeted by German aircraft stationed in Norway and Denmark, and by the bombers of German Air Fleet 2 stationed in north-eastern France. These attacks began in the autumn of 1939 and continued long after the end of the fighter battle in 1940.

The northern areas of Britain, from the Humber Estuary to the Orkney Islands, which housed the Royal Navy's main base at Scapa Flow, were integrated into the overall defensive air plan, but were not strongly defended. The Home Chain radar stations were set up as far north as the Firth of Forth, while three divisions of anti-aircraft artillery defended the vulnerable port areas from the Humber to the Forth. A separate Orkney and Shetland Defence Area was also established, under the control of the Scottish-based 3rd Anti-Aircraft Division. The southern part of the region, from Lincolnshire to north Yorkshire, was defended by the aircraft of 12 Group, Fighter Command. Northern England and Scotland were defended by 13 Group. Plans were made to establish 14 Group to defend northern Scotland more effectively, but the organization could not be set up fully in time for the Battle of Britain. By early August, 12 Group had 14 squadrons while 13 Group had 13 squadrons, though only three of these had Spitfires.

Between the outbreak of war and the late summer of 1940, attacks on the area had been made by single aircraft or small groups of bombers which attacked the Humber area, Tyneside, Dundee and Aberdeen. For the German side, these were dangerous operations. Flown almost to the limit of range across wide areas of water, the prospects of finding targets with much accuracy were never good. Aircraft with battle damage or mechanical problems faced the prospect of crashing into a hostile sea long before they could

LEFT: German Junkers Ju 52 troop transport aircraft at an Oslo air base on 9 April 1940. The German invasion of Norway opened up the possibility of attacking targets in northern Britain from Scandinavian bases.

BELOW: The wreckage of one of the first two German aircraft shot down on British soil, a Heinkel He 111 bomber which crashed near Edinburgh in Scotland on 16 October 1939. The bombers were caught by two Spitfire squadrons as they attacked shipping in the Firth of Forth.

LEFT: A rear gunner of a Boulton-Paul Defiant from 264 Squadron, taken on 9 August 1940 at the 12 Group station at Kirton-in-Lindsey, near the Humber Estuary. Attacks on northern England were to be repelled by aircraft from both 12 and 13 Groups.

BELOW: The result of one of many bombing raids on the port of Hull during 1940–41. Around 600 tons of bombs were dropped on the city during the Blitz. The first night raid took place on 24 August 1940 by aircraft stationed in France, but the heaviest bombing came later. Around 1,500 were killed in Hull by bombing during the war.

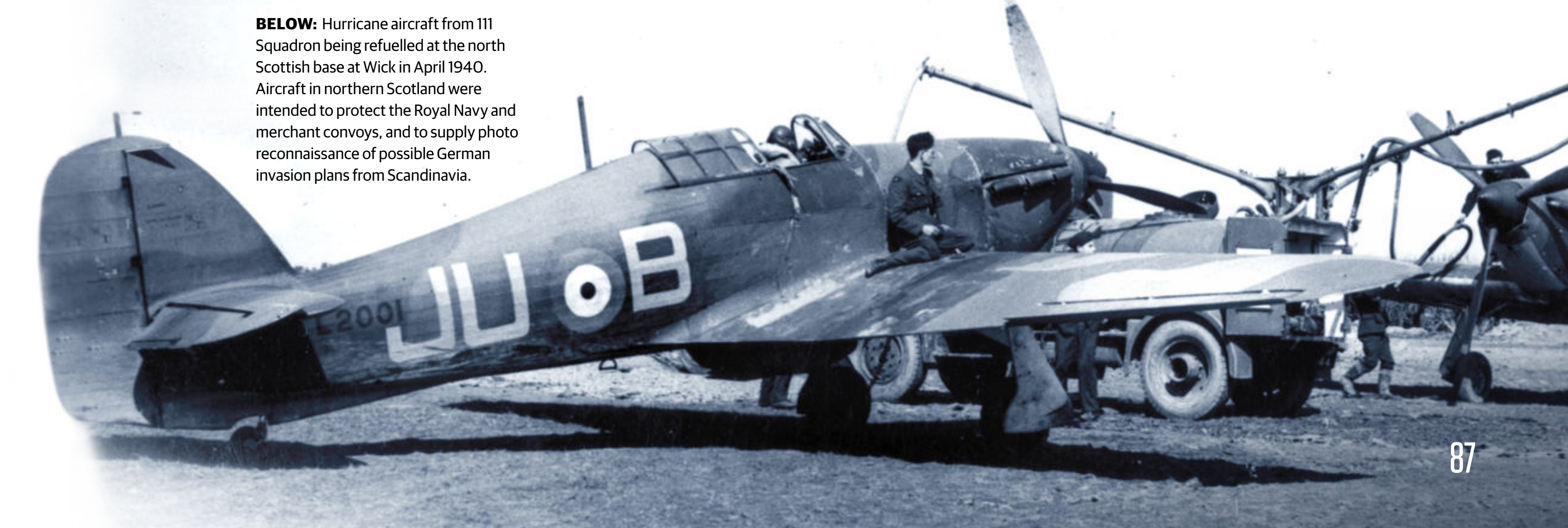
AIR VICE-MARSHAL RICHARD SAUL (1891-1965)

Richard Saul was the commander of 13 Group during the Battle of Britain, and later of 12 Group. He was born in Dublin and entered an army career in the Royal Army Service Corps. He joined the Royal Flying Corps and became a squadron commander by the end of the war. He was a keen sportsman and was RAF tennis champion twice, in 1928 and 1932. He was sent to Basra in Iraq in 1933 to command a squadron but returned to command 13 Group in 1939. He went on to command 12 Group and then the Eastern Mediterranean Air Defences. In June 1944, he retired from the RAF and became head of the UNRRA branch in the Balkans before moving to Rome as the vice chairman of the International Transport Commission. He left Rome in 1951 and became the manager of a university bookshop until retiring for good in 1959.

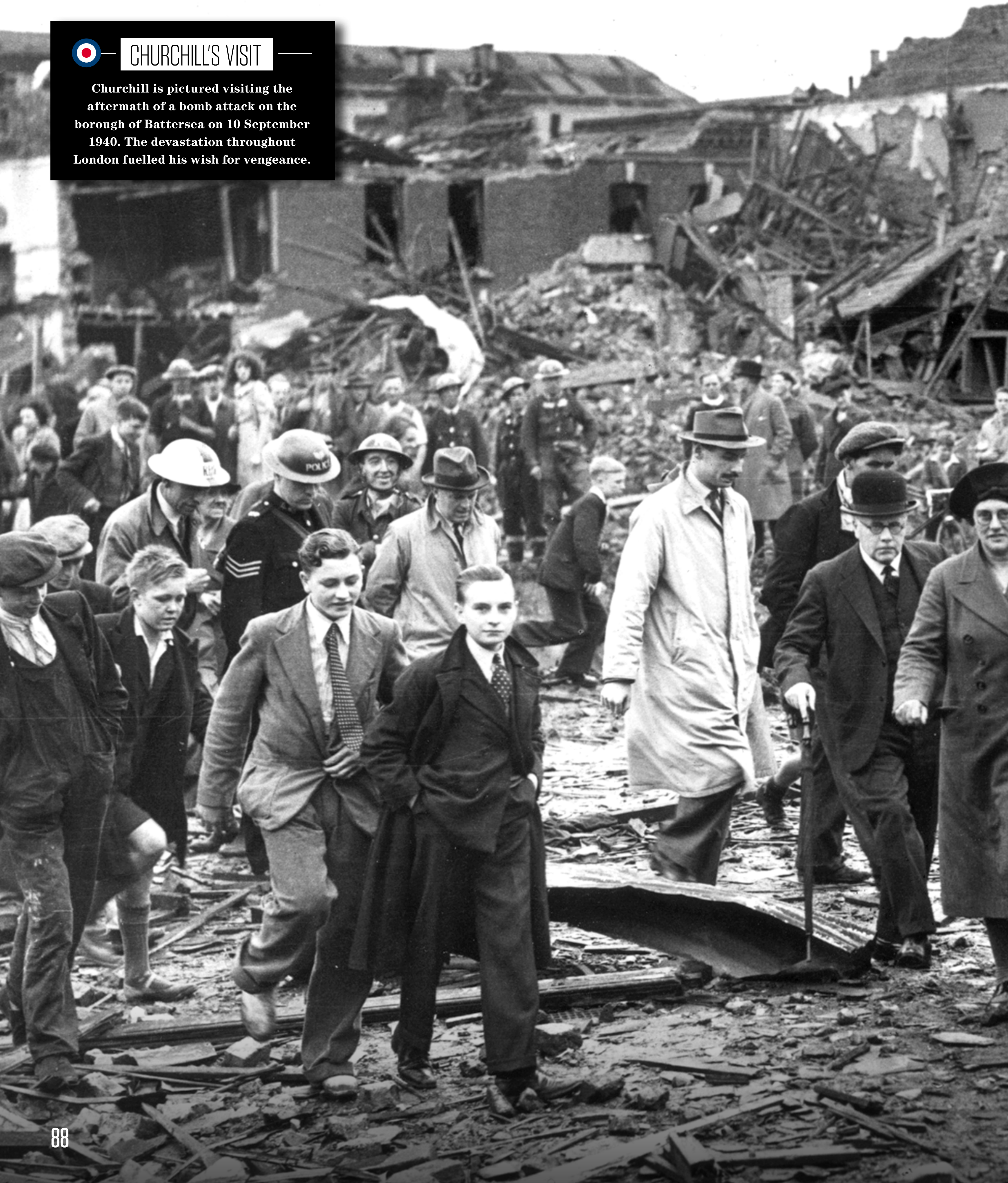
reach land. When "Eagle Attack" was launched on 13 August, Air Fleet 5, stationed in Scandinavia, was expected to play its part in attacking northern Britain to tie down or destroy RAF forces, and to damage British trade and port facilities. On 15 August 1940, 100 aircraft from bases in Norway, made up of 65 Heinkel He 111 bombers and 35 Me 110s used to escort them, set off for an attack on the east coast around Tyneside and north Yorkshire. This proved to be the one major battle over northern Britain.

The fighters of 13 Group were alerted to the incoming force by radar and 72 Squadron's Spitfires were detailed to intercept over sea. The squadron was resting at Acklington after a gruelling few weeks at Biggin Hill. It met the German planes head on and forced the attackers to split up their forces. As the bombers reached the coastline, they were attacked by three further squadrons. The German aircraft inflicted no damage on airfields or factories, but destroyed 24 houses in Sunderland. They were harried the whole way, losing 15 aircraft, including 20 per cent of the Me 110s. A second attack by Junkers Ju 88 bombers stationed at Aalborg in Denmark was more successful. They targeted the RAF bomber base at Driffield in Yorkshire, causing heavy damage. Though met by four squadrons from 12 Group, it proved impossible to prevent the bombers pressing home the attack. Some eight German aircraft were shot down. In both operations that day, Fighter Command lost none of its planes. So severe was the rate of loss for German forces that Air Fleet 5 suspended any further daytime attacks, vindicating Dowding's decision to establish the defensive air shield as far north as possible.

On the same date, 15 August, the German air force mounted night raids against widely dispersed targets in Yorkshire and the north east. This set the pattern for the subsequent air battle in the north. Night raids were undertaken against ports and major cities throughout the region weeks before the onset of the Blitz against London in September. On 31 August, there was a major raid against Liverpool. Although the fighter battle was confined to the major raids on 15 August, the north was never free of the air threat throughout the Battle of Britain.



BELOW: Hurricane aircraft from 111 Squadron being refuelled at the north Scottish base at Wick in April 1940. Aircraft in northern Scotland were intended to protect the Royal Navy and merchant convoys, and to supply photo reconnaissance of possible German invasion plans from Scandinavia.



CHURCHILL'S VISIT

Churchill is pictured visiting the aftermath of a bomb attack on the borough of Battersea on 10 September 1940. The devastation throughout London fuelled his wish for vengeance.

CHURCHILL AND THE "FEW"

Winston Churchill's extraordinary reputation rests more than anything else on his defiant leadership of the British people during the Battle of Britain, a phrase that he himself first used on 18 June 1940 when he announced that the battle for France was over and "the battle of Britain is about to begin". At the very height of the battle, he famously told the House of Commons that the pilots of Fighter Command, the "few", were battling to save civilization for the many.

Churchill had always had an interest in air power and had helped to initiate long-distance bombing in 1914–15 by the Royal Naval Air Service against German airship bases. His understanding of the nature of air power was nevertheless unsophisticated and throughout the air battles of the summer of 1940, senior commanders battled to resist Churchill's demands to use up all available reserves regardless of the consequences. In May 1940, shortly after Churchill became prime minister, there developed a crisis over the supply of fighter aircraft to assist in the land battle in France. Churchill wanted to send as many squadrons as possible until finally persuaded on 19 May to agree to suspend any further transfers. High wastage continued however, and at a tense cabinet meeting on 3 June Dowding, using a graph showing the current loss rates of Hurricanes, made it clear to Churchill that the air battle in France would have to be ended in favour of conserving Fighter Command for the expected German assault.

Churchill was aware how much numbers counted and appointed Lord Beaverbrook to the new post of Minister of Aircraft Production to speed up the supply of fighters. He found it difficult to grasp the effort needed to accelerate production and was impatient for instant results. In mid-August 1940, he demanded of the Air Minister, Sir Archibald Sinclair, why the 1,600 pilots assigned to staff duties and the 2,000 pilots involved in training were not in the skies resisting the Germans, and had to be persuaded that many were well over age or essential to keeping up the supply of trained pilots. Throughout the battle, Churchill insisted on being supplied with regular reports of the number of available aircraft and pilots each day.

BELOW: Standing with the commander of British anti-aircraft defences, Sir Frederick Pile (left), Churchill looks anxiously at the sky during the air battles over London in September 1940.

ABOVE: Churchill in the cockpit of a Short biplane at Eastchurch on 29 November 1913. Churchill was an air power enthusiast from its inception just before the First World War.

WINSTON CHURCHILL (1874-1965)

Winston Leonard Spencer Churchill was born into the Marlborough family, son of the Conservative politician, Lord Randolph Churchill. He was educated at Harrow and the army college at Sandhurst, and gained his first commission in the Queen's Own Hussars in 1895. He saw action in northern India and the Sudan before resigning his commission in 1899. He became a Conservative MP in 1900, switched to the Liberal Party in 1904 and back again to the Conservatives 20 years later. He achieved high office at a remarkably young age and by 1910 had been appointed Home Secretary, then a year later First Lord of the Admiralty. In the First World War he resigned over his handling of the campaign at Gallipoli, briefly served on the Western Front, then returned to Britain where he became Minister of Munitions in 1917. During the 1930s became an isolated backbencher, opposed to appeasement. In 1939, he was again appointed First Lord of the Admiralty and on 10 May 1940 became prime minister. Defeated at the 1945 election, he returned as prime minister in 1951 before retiring from political life in 1955.

LEFT: Churchill leaving No. 10 Downing Street. When he became prime minister on 10 May 1940, he later wrote that he felt then that he was "walking with destiny".

BELOW: On 28 August 1940, Churchill was driving to inspect defences in Kent when a Messerschmitt Me 109 crashed nearby at Church Whitfield outside Dover. Churchill ordered his car to stop and walked over to view the plane with his personal bodyguard Inspector W Thompson (right).

It was at the high point of the battle that Churchill made his famous "few" speech, on 20 August 1940. A few days earlier he had visited the headquarters of 11 Group and had been heard to mutter to himself in the car afterwards the most memorable phrase of his speech: "Never in the field of human conflict was so much owed by so many to so few." The speech was made in the House of Commons, where a small audience gave it little attention. Churchill said three times as much about Bomber Command as he did about the fighter squadrons. The impact came with the wider public, who grasped the notion that Fighter Command was playing David to Germany's Goliath, and found in the concept of "the few" a fitting testament to British heroism.

By coincidence, Churchill was also present at Park's headquarters in Uxbridge on 15 September, the day later remembered as Battle of Britain Day. On that morning Churchill watched as Park ordered his squadrons into service. As more aircraft were scrambled Churchill asked Park what reserves there were and received the reply, "There are none". Churchill interpreted this as evidence that the force was close to crisis, though Park had only intended to indicate that all his squadrons were currently operational and needed the additional support of 12 Group. The experience left a sombre impact on Churchill which was reflected in the account of the battle in his later history of the war. The experience of the Blitz also had a profound impression on Churchill's outlook. The relative failure of the night air defences against German bombers provoked a crisis at the Air Ministry which resulted in pressure to remove Dowding from command, and although he had long admired him, Churchill in the end made no effort to save Dowding when he was finally transferred in November 1940.

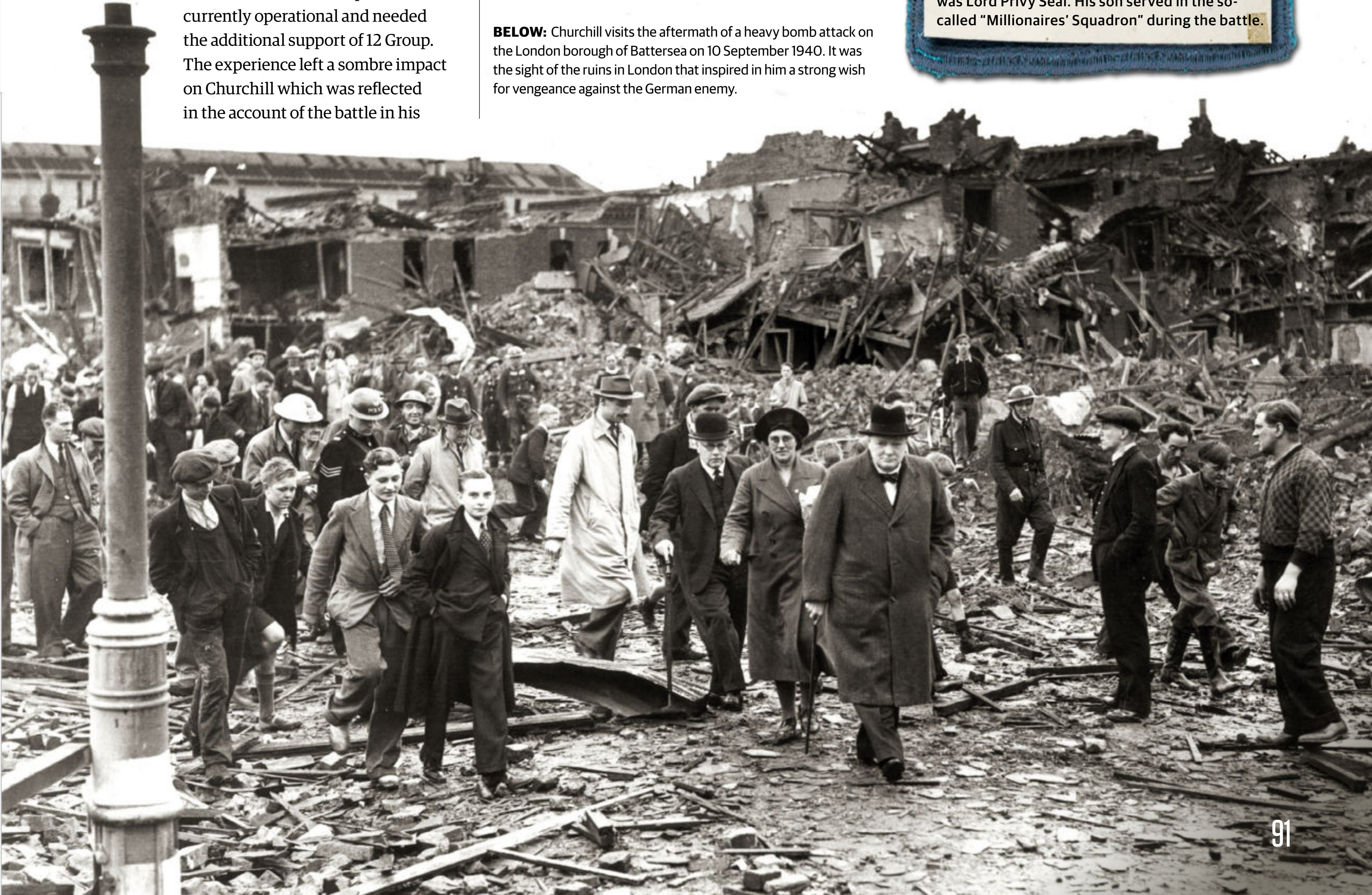
Churchill's role in the summer and autumn of 1940 was not primarily to assist with the practical problems in winning the Battle of Britain, but to rally popular support for the continuation of the war, and to provide the public with evidence of British defiance and fortitude in the face of a brutal enemy. Even though the numbers of air crew and fighters available were almost always higher than the number of German fighter pilots and crew, Churchill also succeeded in cementing in the popular memory of the battle the idea that it was won by the few.

ABOVE: A helmeted Churchill watches the dogfights overhead from an observation post in Dover during a day's fighting in August. He enjoyed being in the thick of the action, and made regular visits and reviews during the course of the Battle of Britain and the Blitz.

BELOW: Churchill visits the aftermath of a heavy bomb attack on the London borough of Battersea on 10 September 1940. It was the sight of the ruins in London that inspired in him a strong wish for vengeance against the German enemy.

LORD BEAVERBROOK (1879-1964)

A close friend of Churchill, William Maxwell Aitken was a leading newspaper proprietor and Conservative politician. He was born in Canada, where he made his fortune, then moved to Britain where he became an MP in 1910. During the First World War, he bought the Daily Express and two years later launched the Sunday Express. He was created Lord Beaverbrook in 1917. In 1923 he added the Evening Standard to his list of papers. He served as Minister of Information in 1918 but did not achieve high political office again until Churchill made him Minister of Aircraft Production in 1940. He succeeded in speeding up fighter output at the cost of the wider aircraft production programmes. In 1941, he was moved to the Ministry of Supply and between 1943 and 1945 was Lord Privy Seal. His son served in the so-called "Millionaires' Squadron" during the battle.

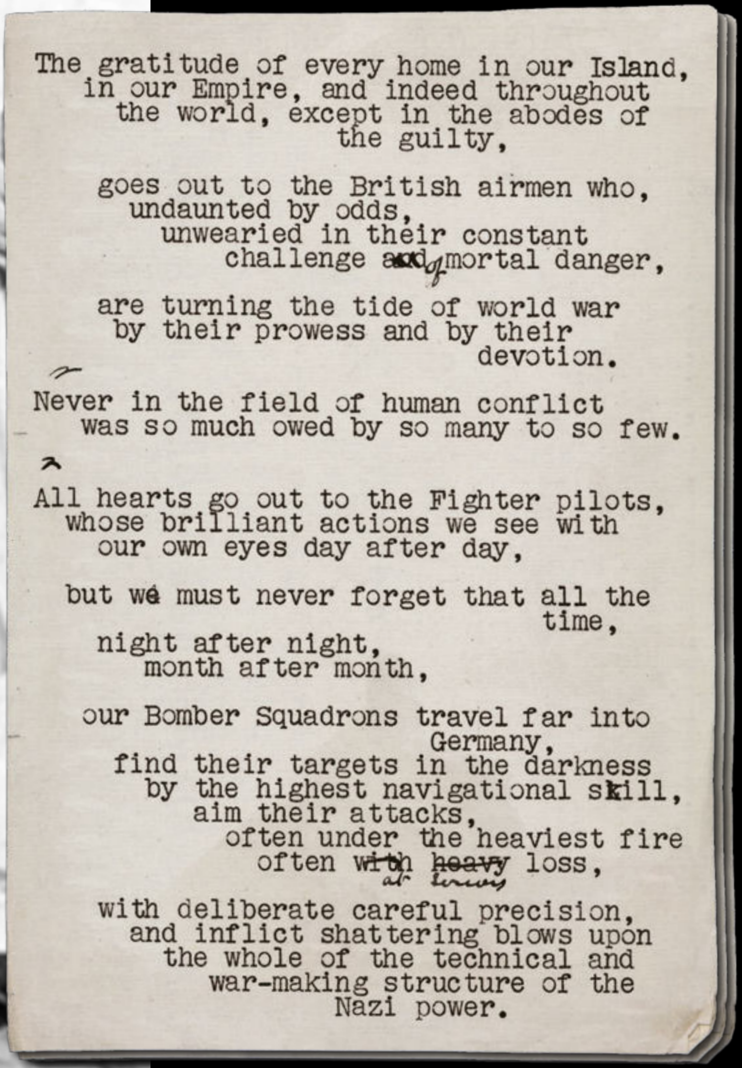


THE FEW

Douglas Bader in 1940 with a crew relaxing in front of a Hurricane. Bader was the principal spokesman for the idea of "Big Wings", the idea of sending up at least three squadrons together to attack with strength.

CHURCHILL'S SPEECH

The page notes from Winston Churchill's speech to the House of Commons on 20 August 1940 in which he talks about "the few". The praise was tempered by his immediate reminder that bomber pilots endured even more difficult combat conditions.



The gratitude of every home in our Island,
in our Empire, and indeed throughout
the world, except in the abodes of
the guilty,

goes out to the British airmen who,
undaunted by odds,
unwearied in their constant
challenge ~~and~~ of mortal danger,

are turning the tide of world war
by their prowess and by their
devotion.

Never in the field of human conflict
was so much owed by so many to so few.

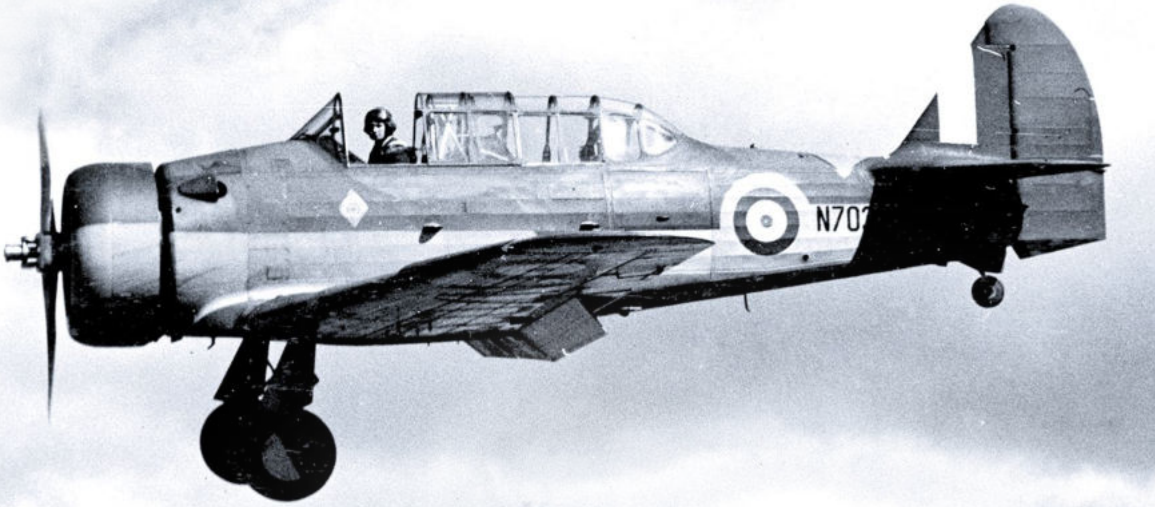
All hearts go out to the Fighter pilots,
whose brilliant actions we see with
our own eyes day after day,

but we must never forget that all the
time,
night after night,
month after month,

our Bomber Squadrons travel far into
Germany,
find their targets in the darkness
by the highest navigational skill,
aim their attacks,
often under the heaviest fire
often ~~with~~ ~~heavy~~ loss,
at serious

with deliberate careful precision,
and inflict shattering blows upon
the whole of the technical and
war-making structure of the
Nazi power.

THE PILOTS

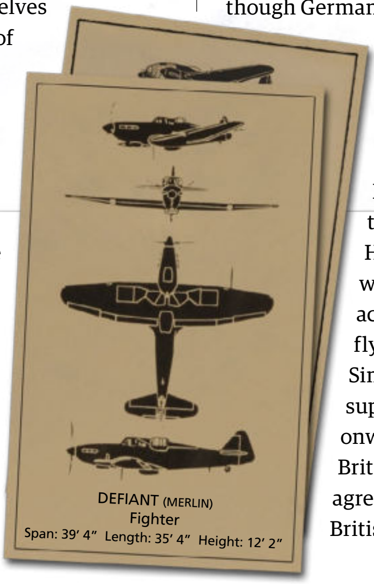


ABOVE: An RAF trainer aircraft, the American-built North American Aviation "Harvard", landing at Brize Norton airfield in July 1940. The RAF bought 400 of the sturdy trainers in the 1930s, and they were used from 1939 onwards as the first step in preparing pilots for the transition to the new high-performance Spitfires and Hurricanes. A further 1,173 were made available in the war under Lend-Lease.

The life of a pilot during the Battle of Britain had much in common on both sides of the conflict. Both air forces were an elite, more highly trained than almost any other units in the armed forces. Compared with an army, the numbers involved in flying and fighting during the Battle of Britain were tiny. The squadron organization put together small numbers of men who had to work as a team to be successful. Losses of squadron members made it necessary to create a system where newcomers could be integrated into established fighting units. Pilots could regard themselves as special, but the harsh reality of combat was a high rate of death and disablement.

The German air force in 1939 had a larger and more sophisticated system of pilot recruitment and training than any other European force. There were an estimated 50,000 aircrew available when war broke out, trained in a total of 100 training schools. The British system was much smaller but was expanding rapidly in 1939, and became capable by the time of the battle of supplying more fighter pilots per week than the German air force. The pattern of training was similar, though German pilots had many more flying hours, including 150 on basic flying training and a further 50 specialized in flying on the aircraft they would fly in combat. The German Flying Training Regiment was the equivalent of the British Initial Training Wing. Here pilots were familiarized with military life. There followed actual flying training in elementary flying training schools in Germany. Similar schools in Britain were supplemented from April 1940 onwards by the creation of the British Empire Air Training Scheme, agreed between the countries of the British Commonwealth at Ottawa in December 1939. By its peak in 1942, the scheme could turn out 28,000 aircrew per year. Most of the RAF crew trained abroad came from schools in Southern Rhodesia, South Africa and Canada.

With the coming of war, basic training was supplemented by an intermediate stage of combat training on the aircraft that a pilot was destined to fly. In 1939, operational training schools were set up in Germany and operational training units in Britain. These units took some of the aircraft and skilled pilots needed on the aerial front line, but it was essential that pilots should become familiar with an aircraft and with the principles of air combat before having to fight. In Britain,



RIGHT: A Defiant spotter card.

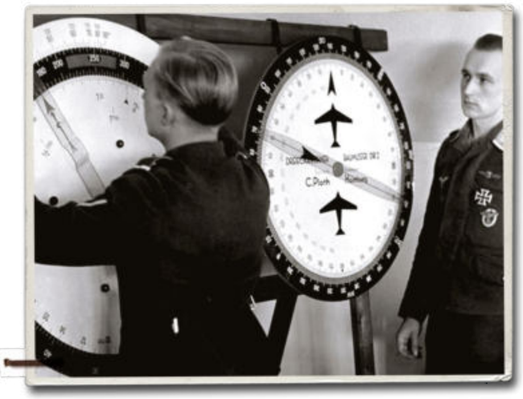
BELOW: The crew of a Hurricane aircraft camp out in a caravan on the airfield awaiting the call to scramble in April 1940.

RIGHT: Pilots of 504 Squadron outside the White Hart Inn, Brasted in Kent. The Hurricane squadron was stationed in Scotland at the start of the battle but was moved south during August.

COLONEL WERNER MÖLDERS (1913–1941)

The most famous German air ace of the Second World War, Werner Mölders claimed 100 enemy aircraft destroyed as his remarkable tally of victories. He joined the German army in 1931, and after learning to fly was posted to the German air force in 1934 as a lieutenant. Despite debilitating physical reactions to flying, Mölders became an effective combat pilot. In April 1938, he joined the German Condor Legion in Spain, fighting for Franco, where he scored his first 15 "kills". He led a unit in the Battle of France and on 19 July was promoted to major and given command of JG51 (51st Fighter Squadron), a unit that became distinguished for its remarkable fighting skills. By the end of the Battle of Britain, Mölders had claimed 30 more "kills". His unit was posted to the Soviet war in 1941, where his grand total of aircraft destroyed finally passed the record set by the Red Baron, Manfred von Richthofen. He was promoted to colonel and made Inspector General of Fighters in August 1941 at the age of only 28. On 22 November 1941, travelling from Russia to Berlin for the state funeral of Ernst Udet, he died in an air crash. His state funeral followed shortly after.

BELOW: A dead German airman in the wreckage of his Junkers Ju 87B dive-bomber brought down over Sussex in August 1940. German pilot losses escalated dramatically during August and September, and included many experienced crew trained in the 1930s.



ABOVE: German airmen at a German flying school in Hanover undergo instruction in navigation during the war. Standards of navigation were high, maximising the impact that German air forces had in attacks on British targets.

BELOW: A group of German pilots with their dogs stand in front of a fighter aircraft at an air base facing the Channel coast in the summer of 1940. Pilots on both sides showed the same strong sense of camaraderie, superstition and courage.

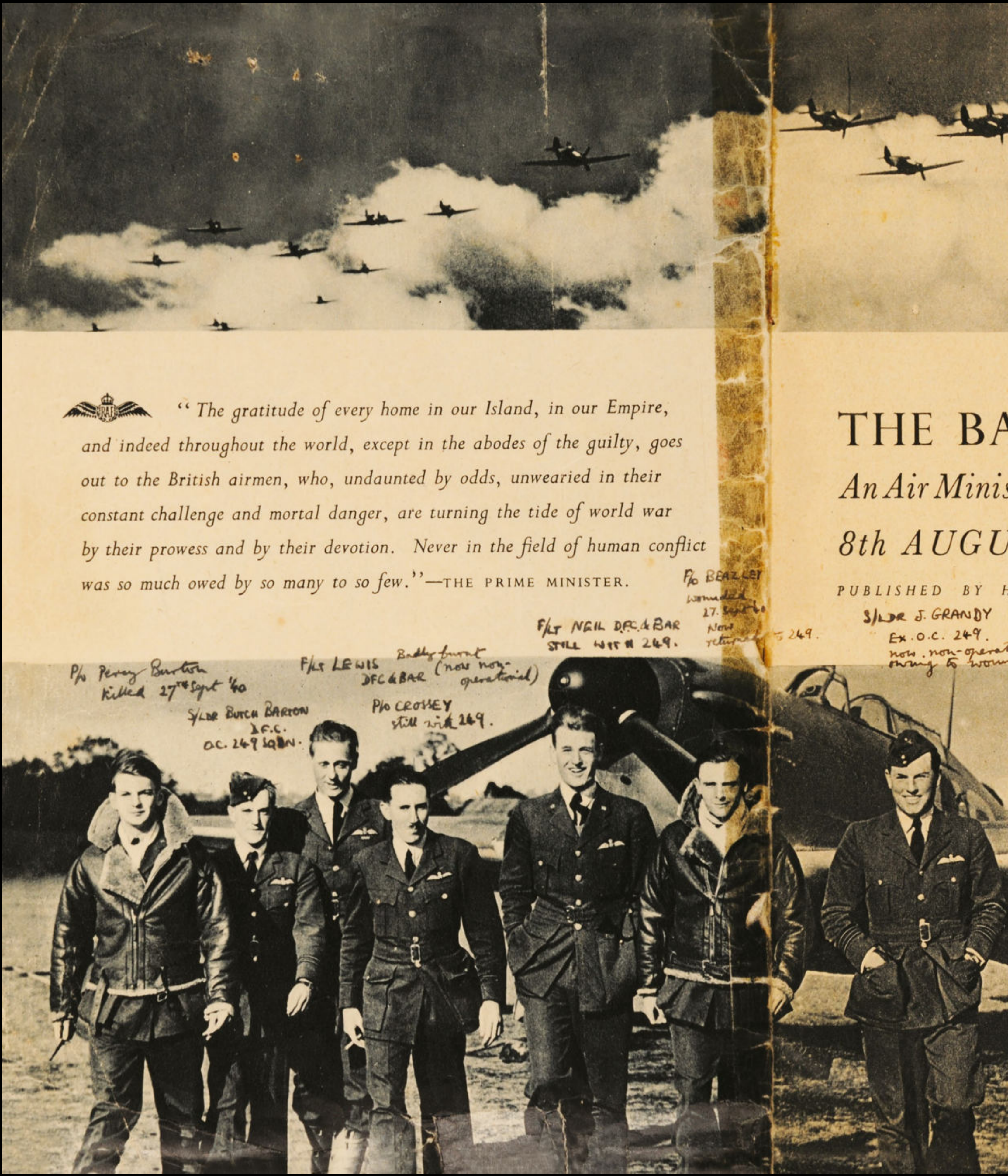
the need to speed up the supply of pilots led to the creation of so-called "C" squadrons made up of five or six experienced pilots, whose job it was to introduce newcomers quickly to actual combat in relatively safe areas of the country before being posted to south-east England. In general, German pilots enjoyed more thorough training before deployment and a longer period of pre-combat flying, which explains their higher kill ratios in battle and their better survival rate.

The Battle of Britain was fought by around 2,000 British and German fighter pilots, while there were around 1,500 bomber pilots in the German air fleets. The German fighter force never had as many pilots on hand as the RAF, averaging 66 per cent of British strength in the weeks of the battle, and sinking to only 50 per cent by November 1940. During August, British operational training units were turning out 320 fighter pilots a month, though casualties reached 22 per cent of the force. The greatest pressure felt on the British side was the shortage of trained ground staff and technicians, both areas where the German air force was better supplied. The one advantage enjoyed by RAF pilots was to fight over home territory. German pilots were lost to the force once they had crash-landed or baled out. In September, the loss rate for the German fighter force rose to over 23 per cent; during the whole course of the battle 967 German aircrew were made prisoners-of-war, while 638 bodies were identified. In contrast, many British airmen who baled out over England found themselves flying again the same day in a new aircraft. Those with light wounds could be flying again after just a few days of recovery.

High rates of casualty and the sheer pressure of fighting over and over again made the pilots' lives particularly arduous. Badly mauled or tired squadrons were withdrawn to recuperate while new squadrons took their place. Those in combat spent hours waiting for the order to scramble to their aircraft and then endured anything from several hours to a few minutes of dangerous flying and combat; after the end of the day's fighting, pilots found themselves in the peculiar position of once again being part of the local civilian community in bars and clubs, and churches. The element of daredevil was never very far from the daily experience of a pilot, caught between the normality of life on base or in the nearby towns and villages, and the knowledge that only his own skill, daring and luck might ensure that he returned the following day. Aerial combat has often been compared with medieval warfare with its emphasis on chivalry and individual prowess and the many memoirs and diaries of pilots who fought through the battle show that this comparison is not altogether unfounded.

GROUP CAPTAIN ADOLPH "SAILOR" MALAN (1910–1963)

On 18 November 1939, two squadrons of German bombers were activated as "pathfinder" units tasked with leading bombers accurately to distant targets. On 13 July 1940, a third squadron was activated. The force was named Kampfgruppe 100 (Bomber Group 100) and received special training in navigating with a new system of radio beams known as X-Gerät. Using four radio beams from different directions, the force was able to arrive over the target with a high level of accuracy. During the Battle of Britain, the unit was commanded by Captain Kurt Aschenbrenner. On the night of 13 August, the group first attacked the large Spitfire factory at Castle Bromwich in Birmingham with 11 bombs, doing little serious damage. Later Kampfgruppe 100 led the major raids against British cities during the Blitz.



"The gratitude of every home in our Island, in our Empire, and indeed throughout the world, except in the abodes of the guilty, goes out to the British airmen, who, undaunted by odds, unwearied in their constant challenge and mortal danger, are turning the tide of world war by their prowess and by their devotion. Never in the field of human conflict was so much owed by so many to so few."—THE PRIME MINISTER.

THE BA

An Air Minis

8th AUGU

PUBLISHED BY H

F/o BEAZLEY
wounded
27. Sept '40
Now
returned to 249.

S/LDR J. GRANDY
Ex. O.C. 249.
now. non-operat
owing to woun

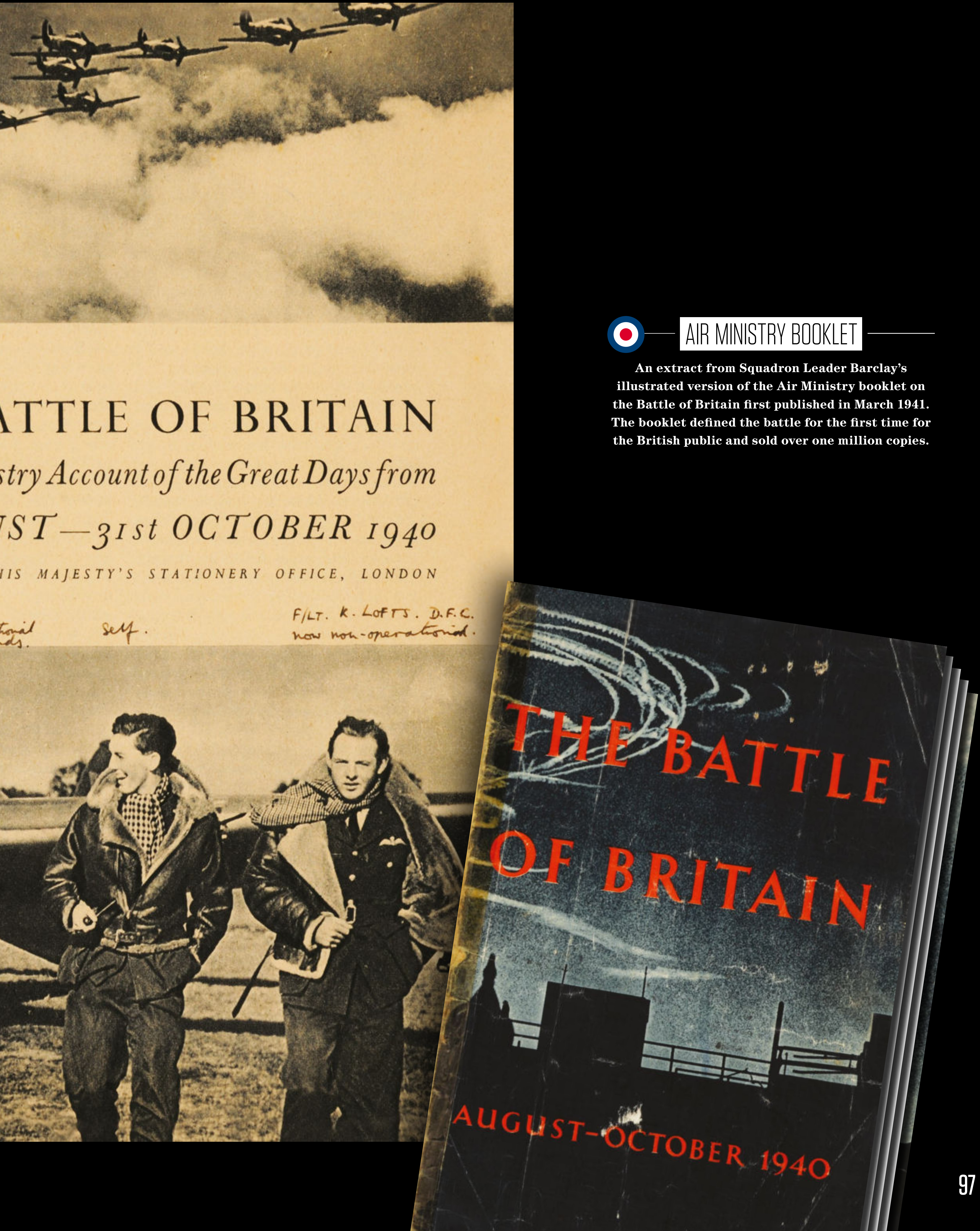
F/LT NEIL DFC & BAR
STILL WITH 249.

P/o Percy Burton
Killed 27th Sept '40

F/LT LEWIS
DFC & BAR
Badly burnt
(now non-operational)

S/LDR BUTCH BARTON
D.F.C.
O.C. 249 SQDN.

P/o CROSSEY
still with 249.



ATTLE OF BRITAIN

stry Account of the Great Days from

UST—31st OCTOBER 1940

HIS MAJESTY'S STATIONERY OFFICE, LONDON

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ds.

Self.

F/Lt. K. Lofts. D.F.C.
now non-operational.

THE BATTLE OF BRITAIN

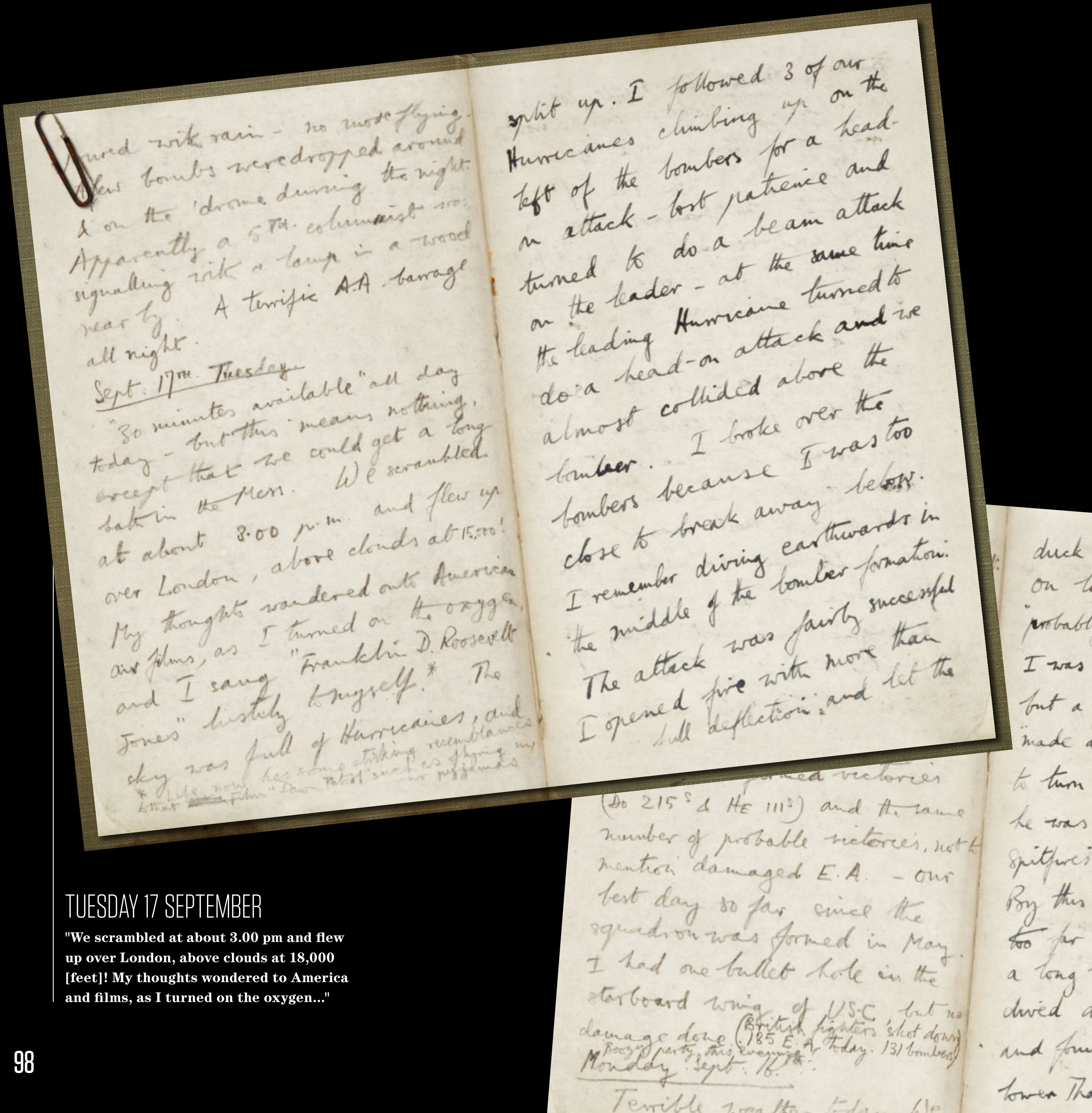
AUGUST–OCTOBER 1940

AIR MINISTRY BOOKLET

An extract from Squadron Leader Barclay's illustrated version of the Air Ministry booklet on the Battle of Britain first published in March 1941. The booklet defined the battle for the first time for the British public and sold over one million copies.

SQUADRON LEADER R.G.A BARCLAY'S DIARY

An extract from the handwritten diary of Squadron Leader R.G.A. Barclay for the period from 1-18 September 1940. Barclay flew Hurricanes and on Battle of Britain Day, 15 September, he was buzzed by a Spitfire shortly after engaging with German bombers.



Poured with rain - no more flying.
A few bombs were dropped around
& on the 'drome during the night.
Apparently a 5th. columnist was
signalling with a lamp in a wood
near by. A terrific A.A. barrage
all night.

Sept: 17th. Tuesday.

"30 minutes available" all day
today - but this means nothing,
except that we could get a long
bath in the Mess. We scrambled
at about 3.00 p.m. and flew up
over London, above clouds at 15,000!
My thoughts wandered onto American
air films, as I turned on the oxygen,
and I sang "Franklin D. Roosevelt
Jones" lustily to myself.* The
sky was full of Hurricanes, and

* Life now has some striking resemblances
to that ~~air~~ film "Dawn Patrol" such as flying in our pyjamas

split up. I followed 3 of our
Hurricanes climbing up on the
left of the bombers for a head-
on attack - lost patience and
turned to do a beam attack
on the leader - at the same time
the leading Hurricane turned to
do a head-on attack and we
almost collided above the
bomber. I broke over the
bombers because I was too
close to break away below.
I remember diving earthwards in
the middle of the bomber formation.
The attack was fairly successful
I opened fire with more than
full deflection and let the

firmed victories
(Do 215s & He 111s) and the same
number of probable victories, not to
mention damaged E.A. - our
best day so far since the
squadron was formed in May.
I had one bullet hole in the
starboard wing of V.S-C, but no
damage done. (British fighters shot down
185 E.A. today. 131 bombers)
Boozy party this evening.

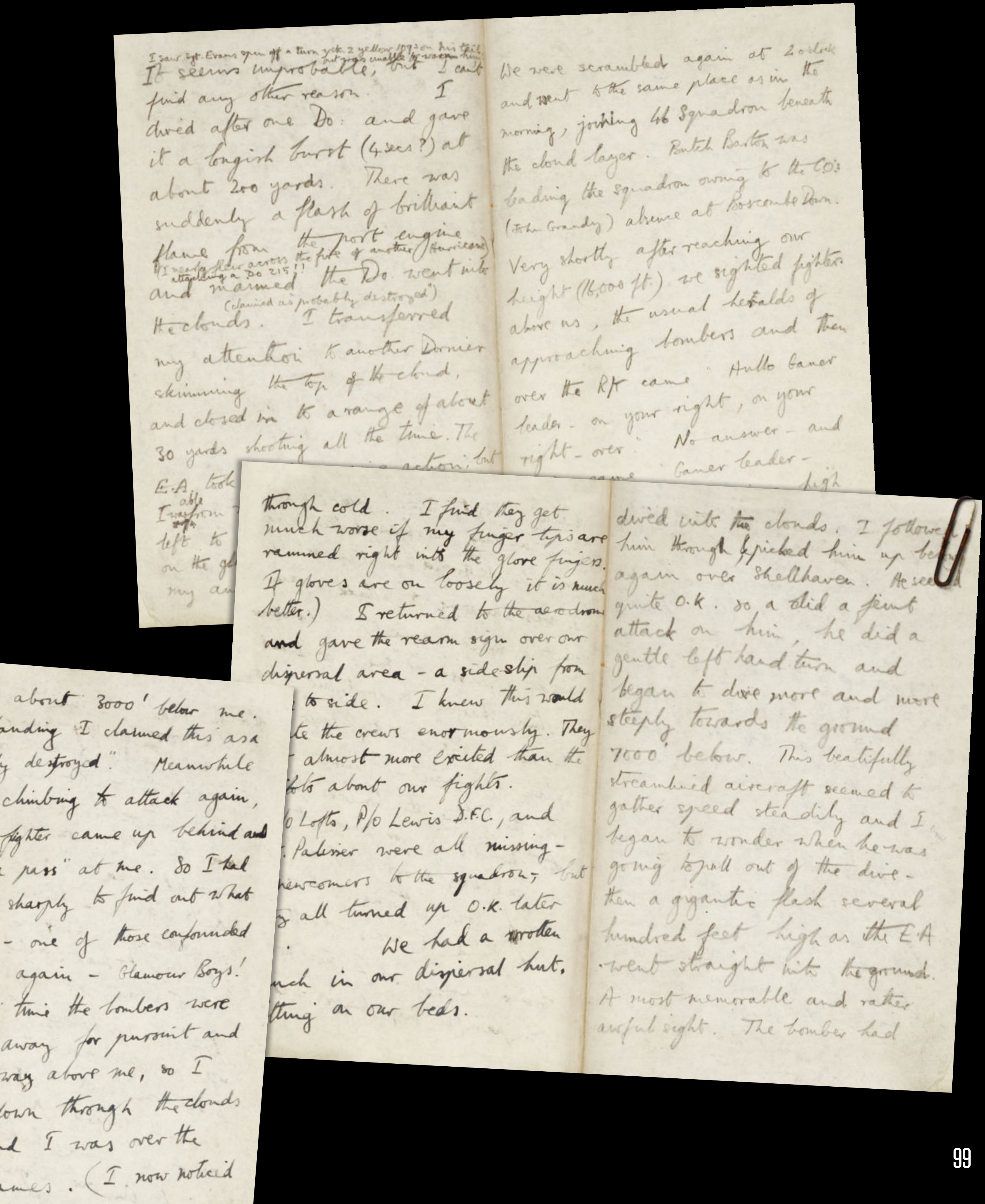
Monday Sept: 16th.

Terrible weather today. We

duck
on t
probabl
I was
but a
made a
to turn
he was
Spitfires
Boy this
~~too~~ far
a long
dived a
and fou
lower The

TUESDAY 17 SEPTEMBER

"We scrambled at about 3.00 pm and flew up over London, above clouds at 18,000 [feet]! My thoughts wondered to America and films, as I turned on the oxygen..."



I saw Sgt. Evans spin off a turn with 2 yellow 109's on his tail
but was unable to warn him
It seems improbable, but I can't
find any other reason. I
dived after one Do: and gave
it a longish burst (4 secs?) at
about 200 yards. There was
suddenly a flash of brilliant
flame from the port engine
(I nearly flew across the fire of another Hurricane
attacking a Do 215!!)
and maimed the Do. went into
(claimed as "probably destroyed")
the clouds. I transferred
my attention to another Dornier
skimming the top of the cloud,
and closed in to a range of about
30 yards shooting all the time. The
action; but
E.A. took
I was able from
left to
on the gl
my an

We were scrambled again at 2 o'clock
and went to the same place as in the
morning, joining 46 Squadron beneath
the cloud layer. Butch Barton was
leading the squadron owing to the C.O.'s
(John Grandy) absence at Boscombe Down.
Very shortly after reaching our
height (16,000 ft.) we sighted fighters
above us, the usual heralds of
approaching bombers and then
over the R/T came "Hullo Gamer
leader - on your right, on your
right - over". No answer - and
Gamer leader -
came
high

about 3000' below me.
nding I claimed this as a
y destroyed". Meanwhile
climbing to attack again,
fighter came up behind and
pass" at me. So I had
sharply to find out what
- one of those confounded
again - Glamour Boys!
time the bombers were
away for pursuit and
way above me, so I
own through the clouds
d I was over the
mes. (I now noticed

through cold. I find they get
much worse if my finger tips are
rammed right into the glove fingers.
If gloves are on loosely it is much
better.) I returned to the aerodrome
and gave the rearm sign over our
dispersal area - a side-slip from
to side. I knew this would
te the crews enormously. They
almost more excited than the
lots about our fights.
o Lofts, P/o Lewis D.F.C., and
Palisser were all missing -
newcomers to the squadron; but
all turned up O.K. later
. We had a rotten
nch in our dispersal hut,
tting on our beds.

dived into the clouds. I followe
him through & picked him up be
again over Shellhaven. He see
quite O.K. so a did a feint
attack on him, he did a
gentle left hand turn and
began to dive more and more
steeply towards the ground
7000' below. This beautifully
streamlined aircraft seemed to
gather speed steadily and I
began to wonder when he was
going to pull out of the dive -
then a gigantic flash several
hundred feet high as the E.A.
went straight into the ground.
A most memorable and rather
awful sight. The bomber had

71 EAGLE SQUADRON

Pilots from the all-American 71 "Eagle" Squadron, formed in September 1940. The three existing all-American squadrons were later absorbed into British-based forces.

MAUD

THE COMMANDERS

The Battle of Britain produced a confrontation between air commanders of the highest quality. On the British side, Air Vice-Marshal Keith Park, a New Zealander who came to Britain in 1916, played a central part in devising a set of tactics which would maximize the impact that his force might have on the enemy. On the German side, the two main air fleet commanders, Field Marshal Albert Kesselring and Field Marshal Hugo Sperrle – both promoted to their rank by a grateful Hitler in July 1940 after the defeat of France – also developed flexible tactical approaches to the battle as it unfolded over the summer of 1940.

The German side nevertheless laboured under a large disadvantage. The conduct of operations by Kesselring's Air Fleet 2 and Sperrle's Air Fleet 3 was overseen by the German air force commander-in-chief, Hermann Goering. His interventions, often prompted by discussions with Hitler, seldom bore much relation to reality on the battlefield. Although Kesselring and Sperrle were allowed to argue over issues where they thought strategic choices were wrong, they had little

RIGHT: A festival for the aviation sector of the Hitler Youth at the German Air Ministry on 1 April 1940. The grandiose building was constructed on Leipzigerstrasse in Berlin and is still used today as ministerial offices.

AIR CHIEF MARSHAL SIR KEITH PARK (1892–1975)

Keith Park was born in New Zealand, the son of a geologist. He saw service as an artilleryman during the First World War, first in the ANZAC landings at Gallipoli, then in the Battle of the Somme. Wounded in France, he joined the Royal Flying Corps in December 1916. He became something of an air ace and ended the war as a major commanding 48 Squadron. He remained in the post-war RAF and in 1938 became one of Dowding's staff officers. He took command of 11 Group as an air vice-marshal in April 1940, but was posted away to Training Command later in the year. In January 1942, he went to Egypt as the local air commander, and then oversaw the air defence of Malta in the summer of 1942. He ended the war as Allied Air Forces Commander-in-Chief, South East Asia. After promotion to air chief marshal, he returned to New Zealand in 1946 where he took part in local politics until his retirement.

BELOW: Erhard Milch (far right), the former director of Lufthansa and state secretary in the German Air Ministry, at RAF Mildenhall whilst on an official visit in 1937. He was shown the British "shadow" aircraft factories and was impressed by what he saw, but he was resented by Goering and excluded from much decision-making in the years before the outbreak of war.

ABOVE: German air force commanders in dress uniform at a reception held in Hitler's office on 4 September 1940. To Hitler's left stand Hermann Goering and Albert Kesselring, commander of Air Fleet 2. To his right are Hugo Sperrle, commander of Air Fleet 3, and Erhard Milch, state secretary of the Air Ministry.

FIELD MARSHAL ALBERT KESSELRING (1885–1960)

One of the most successful air commanders of the Second World War, Albert Kesselring was one of many young army officers who converted to the German air force when it was created in 1933. He was born in Bavaria and served in staff positions in the First World War. In 1933, he was appointed to run the administrative office of the newly founded Air Ministry and learned to fly at the age of 48 in order to understand his task better. In 1936, he became air force chief of staff, and in 1938 commander of the First Air Fleet. He led the Second Air Fleet in the Battle of France, for which he was promoted to field marshal. He continued to command his fleet during the Battle of Britain and later in the invasion of the Soviet Union, but was posted as Commander-in-Chief South to stabilize the campaign in the Mediterranean. He led German forces in the Italian campaign, and then took over command in north-west Europe in March 1945. In 1947, he was condemned to death for ordering reprisals in Italy, but the sentence was commuted to life imprisonment and he was released in 1952 in poor health.

hope of overturning a decision once Goering had made it. The best example of this was the choice made in early September to switch to attacks on London. Sperrle, who had commanded the German Condor Legion during the Spanish Civil War, understood well enough that Fighter Command had not been defeated. He wanted to continue to concentrate German efforts on destroying Fighter Command's capacity to inflict damage by means of attacks on airfields and radar stations. Kesselring, on the other hand, assumed that decisive combat with Fighter Command could only be achieved by luring RAF fighters up into the air and then defeating them in open battle with German fighters. Since the information available to Goering suggested that Fighter Command was close to exhaustion, he opted for the argument that London should now be the target. This also satisfied Hitler's demand that since Berlin was being targeted by the Allies, any immunity for London should be removed.

Throughout the battle, Sperrle and Kesselring sought ways to engage Fighter Command in unequal combat. They used diversionary attacks, operations only using large numbers of fighters and regular flights over the Channel to tempt British fighters over water (something that was prohibited by Park). Some of the losses inflicted on Fighter Command were due to these tactical adjustments. Yet for German commanders, however well they understood the tactical dimensions of the effort to win air superiority, the overall problem was the requirement laid down in regular directives from Hitler and from Goering to attack a wide variety of dispersed targets with a force of medium bombers and fighters at the limit of their operational range.

ABOVE: A meeting of the British Air Council in March 1941. They were governing body of the RAF, and included air commanders and politicians. In the centre sit the air minister, Sir Archibald Sinclair and the RAF chief of staff, Sir Charles Portal (right).

Park had a difficult task in the face of the large numbers of German aircraft and the certainty that his Group would bear the brunt of the air assault. He was a clear-sighted and organized manager of the battlefield, and he was fortunate in suffering much less intervention from on high than his German counterparts. Park's most important tactical priority was to ensure that squadrons attacked or defended in pairs, allowing enough strength to inflict damage on the enemy, but not exposing too much of the force to German counter-attack at any one time. This choice meant that Fighter Command took a high rate of casualty, with squadrons often fighting against larger numbers. It also meant that a wide number of targets could be defended and that the approaching bombers would understand that even if they evaded one series of attacks, they would be subject to more over the course of their long and dangerous round trip. Park was also successful in September in persuading Dowding to send all the pilots who had good combat experience to fight in south-east of England, leaving the less imperilled squadrons further north and west to cope with the more inexperienced personnel.

Yet for all his successes in adapting his force swiftly to new developments in the height of battle, he suffered regular criticism from other senior airmen who thought they could fight it better. In November 1940, he was abruptly told that he was to be relieved of his command. Hugo Sperrle, on the other hand, was kept in place in northern France throughout the four years leading to the Normandy invasion in June 1944, when he had the final ignominy of trying to combat Eisenhower's 12,000 aircraft with the 170 aircraft still left to him to defend the coast of France.

AMERICANS IN FIGHTER COMMAND

AUGUST 1940

Among the large number of non-British pilots who flew in the Battle of Britain were eight Americans who had volunteered to fly aircraft on the Allied side. They risked a great deal since they violated the American Neutrality Legislation of 1937. The penalty for fighting for a belligerent power was loss of US citizenship, a fine of $10,000 and a possible prison sentence. They were almost all of them very enthusiastic flyers who were eager to get out and do something more than perform air stunts or fly freight.

A number of the volunteers were recruited by the American mercenary Charles Sweeny, whose network of contacts in the United States and Canada was used to supply false papers and money for potential recruits to the French air force. Another recruiting agency, the Clayton Knight Committee, supplied over 8,000 pilots to serve with the Royal Canadian Air Force and the RAF. Though many later flew from British bases, none of them served in the Battle of Britain. Three of the Americans who did fight in 1940 – Eugene Tobin, Andrew Mamedoff and Vernon "Shorty" Keough (who was only 1.47 metres (4ft 10in) high – were sent to France by Sweeny, arriving in early June 1940 just as French resistance to the German invasion was crumbling. They fled south away from the German army and managed to board the last refugee boat to leave France for England on 23 June.

In Britain, the three Americans, with the help of sympathetic MPs and influential Americans living in London, joined the RAF. They were sent for training in July and on 16 August they were posted to the 11 Group fighter station at Middle Wallop to join 609 Squadron. That same day the first American to join Fighter Command, the American Olympic bobsleigh gold medallist Billy Fiske, was shot down. Fiske had spent much of his time in Britain before the war and had numerous friends in British high society. He joined the RAF on 18 September 1939 and was posted in July 1940 to 601 (Auxiliary) Squadron, also known as the "Millionaires' Squadron" because of the wealthy society men who had first formed it. Fiske was a popular and skilful pilot but on 16 August a German Ju 87 dive-bomber succeeded in setting the reserve fuel tank of his Hurricane alight. Fiske refused to bale out and flew his plane back, badly burned. He died of his injuries the following day.

A second casualty in August was a young American airman, Arthur Donahue. He had made his way from Minnesota via Canada to London in June 1940. He was signed up by the RAF, and joined 12 Group's 64 Squadron on 3 August 1940. Nine days later he was hit by an Me 109 and although able to return to base, he was badly burned. He survived, but did not see action again until the battle was over. Three other Americans flew during the battle: John Haviland, who lived in Britain before the war, was posted to 151 Squadron but crashed his Hurricane in training and saw no combat during the battle; Phillip Lekrone came

GENERAL CARL "TOOEY" SPAATZ (1891–1974)

General Spaatz (above centre) was the commander of the US 8th Air Force in Britain in 1942. He was chosen to go to Britain two years earlier, in 1940, as an observer of the Battle of Britain. He was a career airman, first seeing action on the US-Mexican border in 1916 and again in France at the end of the First World War. He served in various command and staff positions in the interwar years, and in November 1940 became Chief of the Plans Division of the US Air Corps. After serving in Britain in 1942 he was sent to the Mediterranean as commander of Allied Air Forces under Eisenhower. In December 1943 he was also appointed commander-in-chief of all US Strategic Air Forces in Europe. After the war he became the first chief of staff of the newly formed US Air Force in September 1947. He retired from the service in 1948.

BELOW (FAR LEFT): A group of pilots from the all-American 71 "Eagle" Squadron, formed in September 1940. There were three all-American squadrons until they were finally absorbed into the British-based US Army Air Forces later in the war.

LEFT: Bobby Fiske, the American Olympic bobsleigh champion, in RAF uniform in 1940.

BELOW: Three of the Americans who served in the Battle of Britain. From left to right, Eugene Tobin, Vernon Keough and Andrew Mamedoff. Keough was less than five feet in height and was affectionately known as "Shorty".

via Canada in July and was posted to 616 squadron in September, but flew only one combat mission during the battle; the last was Hugh Reilley, who posed as a Canadian to gain entry, and was posted to 66 Squadron on 17 September. Reilley was shot down by the German air ace Werner Mölders on 17 October. Of all the pilots who joined during the Battle of Britain, only Haviland survived the war.

The American presence was eventually acknowledged by Winston Churchill who agreed to a suggestion from Sweeny's nephew that a separate squadron should be established for American pilots. The Eagle Squadron, No 71, was activated in mid-September 1940, one of three eventually formed before all American units were absorbed in September 1942 into the US Army Air Forces 4th Fighter Group. Both the British and American governments turned a blind eye to the violation of the neutrality legislation. During the summer of 1940, a delegation of leading American airmen, including the future overall commander of US air forces in Europe, Carl Spaatz, and the US fighter ace from the First World War, Lieutenant Colonel Frank Hunter, was sent to Britain to observe and report on the air battle. Spaatz told the chief of the Air Corps, Henry Arnold, that in his view the Germans' chance of destroying the RAF was "not particularly good". A second delegation sent in October reported that "the Germans have been definitely defeated in day fighting". American commanders drew important lessons from the battle for the future conduct of US air operations after Pearl Harbor.

ABOVE: The chief of the US Army Air Corps, Henry "Hap" Arnold (left), and William Knudsen, the Danish-American car manufacturer and head of the Office for Production Management (right), inspect an American aircraft factory. By the time of the Battle of Britain, a regular flow of aircraft was crossing the Atlantic to meet British needs.

BELOW: A group of pilots from the American "Flying Tigers", volunteers who helped Chiang Kai-shek's Nationalist forces in southern China during the Sino-Japanese war, c.1940. American volunteers were to be found wherever there was air combat even though the United States was formally a neutral country.

THE SWEENYS

Two Americans, an uncle (above right) and nephew both called Charles Sweeny, played an important part in recruiting American citizens to come to Britain and join the RAF in the summer of 1940. The older man, a famous American mercenary who had twice been expelled from West Point, served in the French Foreign Legion during the First World War (where he won the rank of colonel), and then fought regularly in the interwar years, including a spell on the side of Spanish republicans in the civil war. Colonel Sweeny recruited American pilots in the United States to fight for Finland against the Soviet Union, then to fight for France against Germany. Some of his pilots ended up in Britain in June 1940 where his nephew, who was an influential businessman and socialite in London, persuaded the RAF to take on American airmen in designated squadrons. The Eagle Squadrons were the result and Charles Jnr succeeded in getting the RAF to make his flamboyant uncle an honorary Group Captain of 71 Squadron in 1940.

ALLIES IN FIGHTER COMMAND

AUGUST 1940

RAF SQUADRON 303 (POLISH)

One of the Polish squadrons formed during the Battle of Britain was 303 "Kościuszko" Squadron, named after the eighteenth-century Polish hero General Tadeusz Kościuszko. It was formed on 2 August 1940 at Northolt, and became operational at the end of the month with 21 Polish pilots and 135 Polish ground staff, together with RAF commanders to familiarize the crews with Fighter Command requirements. By the time it was withdrawn to rest on 11 October, the squadron claimed the highest number of kills of all RAF squadrons. The 126 claimed was almost certainly an exaggeration though subsequent research has shown at least 44, the highest number for any Hurricane squadron. It maintained its high scoring record in operations over France in 1941–43 and came top in a gunnery competition organized in 11 Group. It remained based in Britain for the rest of the war and was the most successful of the Polish squadrons. Its pilots were the only Poles invited to the victory parade in London, but they refused to attend because other Polish units were not included. The unit was disbanded in December 1946.

Although the large majority of pilots in the Battle of Britain were British, around one-fifth came from Commonwealth countries and from the air forces of nations already conquered by German armies by the summer of 1940. The air effort was genuinely international and became more so as the war went on.

The largest number from overseas came from New Zealand, including the commander of 11 Group himself, Keith Park. Some 127 took part in the battle, many of them volunteers from before the war. There were 30 Australians, who also joined before the outbreak of war. Most of the more than 100 Canadian pilots also arrived pre-war in order to get the opportunity to fly, the motive which had brought most of the volunteers from Australia and New Zealand. In June 1940, the Canadian air force also sent a squadron of Hurricanes to join the defence of Britain and 1 Squadron, RCAF, saw action with 11 Group from 18 August, flying out of Northolt. It was renumbered 401 Squadron in March 1941 to avoid confusion with the RAF's own 1 Squadron. There were also 27 pilots from southern Africa who came to Britain rather than fight with the South African Air Forces. In 1939, the Rhodesians also gave a "gift squadron", No 266, which fought in Spitfires during the battle.

The Commonwealth pilots had none of the problems faced by the European crewmen who wanted to be integrated into Fighter Command, partly because they shared a common language and partly because they had generally been trained in the RAF. The largest contingents from Europe were the Poles and the Czechs, who arrived by a number of routes from the occupation of their countries. By June, there were around 1,500 Poles undergoing training. Problems of language and discipline dogged the training programme, but many of the Polish pilots were already highly trained and demonstrably fearless. Churchill was keen to make use of them and in early July the British cabinet approved the formation of Polish squadrons, in general to be commanded by RAF officers. At least 146 Poles saw action in the Battle of Britain, organized in two squadrons, numbers 302 and 303, or scattered among British squadrons. The Polish air force squadrons were formed in July and August 1940 and achieved a high ratio of kills to losses.

ABOVE (BOXOUT): Polish pilots from the 303 Squadron meet the Air Minister, Sir Archibald Sinclair in October of 1940. The Polish squadrons had among the highest "scores" of any in Fighter Command.

ABOVE RIGHT: Canadian airmen boarding trains at Ottawa on 8 March 1940 at the start of a long Transatlantic journey to serve in the RAF. Eventually thousands of Canadians flew in Fighter and Bomber Command, or in units of the Royal Canadian Air Force.

LEFT: Shoulder badge worn by New Zealanders who flew in the Battle. New Zealand provided the largest number of overseas pilots, 127 in all, including Air Chief-Marshal Keith Park.

BELOW: Trainee French pilots in Britain during a parade salute the French flag. The Free French forces were constituted by Charles de Gaulle in August 1940, but only a handful of French pilots actually saw combat during the Battle.

RIGHT: Two Polish pilots pose with their Hurricane fighter. Despite initial distrust by the authorities, Polish pilots proved to be skilled and fearless in combat, and were allowed to form two squadrons of their own during the Battle of Britain.

BELOW LEFT: Shoulder badge worn by Australian members of the RAF. By September 1940 Fighter Command had become a multinational force.

BELOW RIGHT: Shoulder badge worn by Canadian pilots who flew in the Battle of Britain.

NEW ZEALAND

There were also 88 Czechs serving in Fighter Command, and many others who did ground staff duties at Fighter Command stations. The Czechs were also allowed to form two squadrons in July 1940, numbers 310 and 312, both at Duxford flying Hurricanes, but 312 Squadron was then sent north to defend Merseyside while 310 Squadron fought over southern Britain.

In addition there were 14 French pilots, though the first all-French squadron, No. 341 "Alsace", was not formed until 1943. In summer 1940, there were about 500 French aircrew in Britain. They were used to form the core of the Free French Air Forces. Only a handful took part in the battle, organized in a mixed Anglo-French squadron stationed at Odiham in Hampshire. The rest were organized in forces designed to operate under the orders of Charles de Gaulle, leader of the Free French forces, and later saw service in Africa.

The contribution of the non-British airmen who fought in the Battle of Britain has seldom been acknowledged fully, but many of their names can be read on the monuments to those who died in the battle.

Their motives were mixed. Some joined from a love of flying, some from a hatred of Hitlerism. There was never any question about their quality as pilots and they provided a much-needed core of skilled airmen at a critical point in Britain's war effort.

RAF SQUADRON 310 (CZECH)

The first Czechoslovak Squadron was formed at Duxford on 10 July 1940 flying Hurricanes. It was the first squadron to be manned by foreign pilots, but was commanded by an RAF officer, Squadron Leader Douglas Blackwood. It operated with 12 Group throughout the battle and claimed 37.5 victories. In 1941, it flew fighter sweeps over the Channel and in October 1941 re-equipped with Spitfires. In 1944 it was converted to a fighter-bomber role with the Spitfire IX for the invasion of Normandy. In August 1945, it was flown to Hildesheim in Germany and then on to Prague where it became part of a new Czech air force.

ABOVE: The badge awarded to Czechoslovak pilots on qualification. Squadrons 310 and 312 were Czech fighter sqadrons although the top scoring Czech Battle of Britain Ace, Sergeant Josef Frantisek, flew with the Polish 303 Squadron. He gained 17 "victories" in 28 days.

BELOW: Pilots from Australia, New Zealand and Canada arriving in Britain at the height of the Blitz. Commonwealth crew undertook their initial training in air training schools set up in their own countries and completed operational flying training at British-based training units.

THE BOMBING OF LONDON

7 SEPTEMBER 1940

The first day of the "Blitz" is usually taken to be 7 September 1940. The bombing of ports and towns outside of London had been going on since July, but the first major operation against the capital – and the largest operation of its kind yet mounted by the German air force during the battle – marked a decisive shift in German strategy.

This change has often been attributed to Hitler's anger at a series of RAF raids mounted against Berlin from the night of 25–26 August. On 4 September in a speech to the German parliament, Hitler promised that he would erase British cities in retaliation. But the shift to city bombing had been foreseen in German air force planning once Fighter Command was regarded as close to defeat. Poor intelligence assessments persuaded Goering that the British fighter force was close to extinction and the shift to bombing major ports and industrial cities inland (particularly aircraft industry targets) had already occurred several weeks before Hitler's speech, with heavy attacks on Bristol, Liverpool and Birmingham. On 2 September, Goering ordered heavy attacks on London to begin, and on 5 September they were finally approved by Hitler. The object was now to try to undermine the British war economy, continue the pressure of the blockade and perhaps break the British will to continue the war. That day Goering arrived at Cap Gris Nez to discuss the new campaign with his commanders and, famously, to be photographed staring at the White Cliffs of Dover through binoculars. He told air force leaders that the attack would produce a decisive effect, perhaps within only a few days.

None of this change was yet evident to the British side. On 7 September, Londoners basked in exceptional autumn temperatures, expecting the

GENERAL SIR FREDERICK PILE (1884–1976)

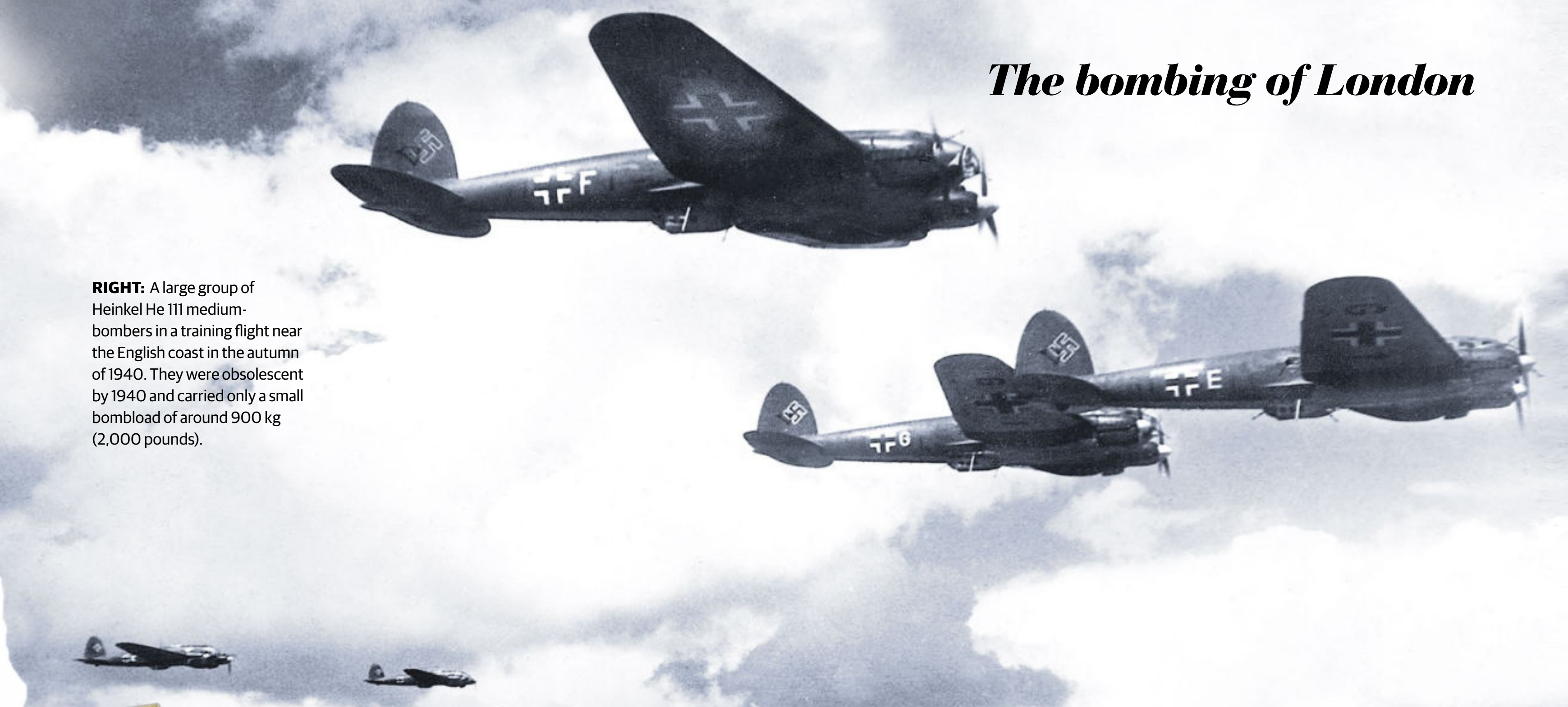
A career soldier who joined the British army in 1902 and served in the Royal Artillery throughout the First World War, Frederick Pile had the responsibility of organizing the anti-aircraft artillery for the Battle of Britain. He joined the Royal Tank Corps in the 1920s and later served in Egypt from 1932 to 1936. The following year he was made a major general and posted to command the 1st Anti-Aircraft Division guarding London. In 1939, he became Commander-in-Chief Anti-Aircraft Command, a post he held throughout the war. After the war, he became Director-General of Housing, Ministry of Works, helping to rebuild the cities his guns had earlier defended.

ABOVE: Brigadier General Sir Frederick Pile with an anti-aircraft gun crew in December 1942.

LEFT: A group of bombed-out survivors of the attacks on Croydon airport and its surroundings on 7 September 1940.

ABOVE: King George VI (third from left) visiting the East End of London the day after the heavy attacks of 7–8 September. A few days later the first bomb fell on Buckingham Palace.

BELOW: German ground crew load bombs onto a Heinkel He 111 during the daylight attacks on British cities. During the course of the battle more incendiaries were used as German commanders realized how much more damage could be done by fire.



RIGHT: A large group of Heinkel He 111 medium-bombers in a training flight near the English coast in the autumn of 1940. They were obsolescent by 1940 and carried only a small bombload of around 900 kg (2,000 pounds).

LEFT: A group of Berliners look at damage done by an RAF Bomber Command raid on 4 October 1940. Although British attacks were small when compared with the Blitz, the operations were designed to demonstrate to the German public that they had no immunity from bomb attack.

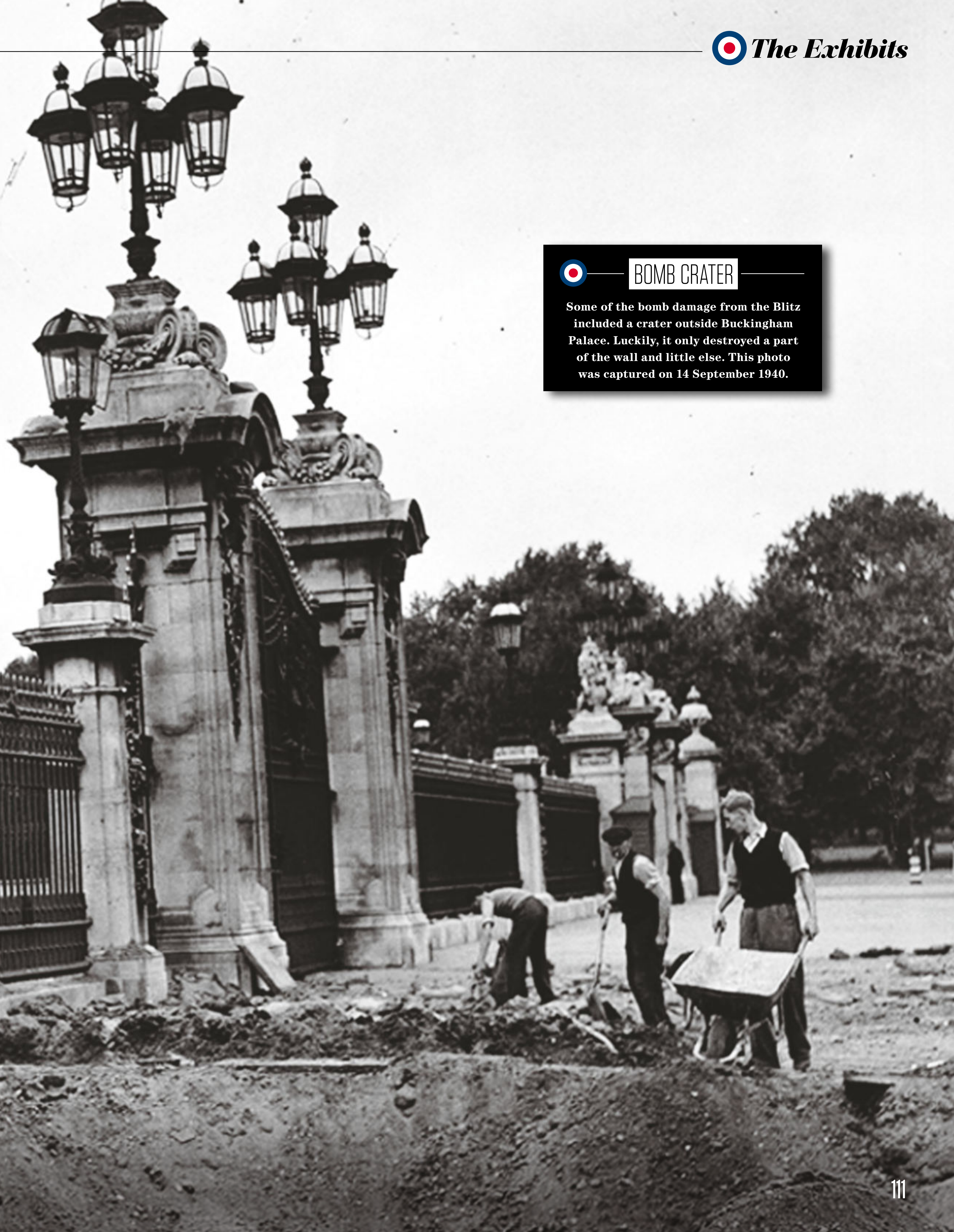
LEFT: British firemen leaving a water-soaked building after fighting fires started during the 10 hours of German bombing on the night of 7–8 September 1940.

air battle to continue against more distant RAF targets. Park was absent from his headquarters on a visit to Bentley Priory. His squadrons and those of 10 and 12 Groups were on standby to expect further attacks on fighter stations. When, at a little before 4 p.m., radar warnings arrived of a substantial force approaching over the Channel, it was assumed that their destination was an attack on Fighter Command. The squadrons airborne were thus positioned to defend airfields, and not to attack a major bomber stream heading for London. The first wave of attack consisted of 348 bombers escorted for the first time by a large part of the fighter force, 617 Me 109s and Me 110s. So large was the fighter force that when Fighter Command eventually got 23 squadrons into the air, they were forced to fight the German fighter screen rather than penetrate to the bombers. The bombers fanned out and attacked the area surrounding the Royal Arsenal at Woolwich, the docks at West Ham and other docks and oil targets along the Thames. Most bombers got through to deliver their load of around 300 tons. The German side lost 40 aircraft, but 28 RAF fighters were lost, 16 heavily damaged and 17 pilots killed or seriously wounded.

At 8 p.m., a second wave of around 300 bombers attacked again, guided by the large fires burning throughout the dockland area. The first bombs dropped on Battersea, where the power station was put out of action. Little could be done to successfully attack the bombers and many of the 264 anti-aircraft guns defending the capital were in the wrong place to engage major raids on central London. German bombers roamed over the capital until 4 a.m. the following morning. A further 330 tons of bombs were dropped and 440 incendiary canisters. A total of 436 Londoners were killed. Churchill himself came out to view the damage the following day. On 11 September, he broadcast to the nation London's resolve to continue "taking it". By that time, over 1,000 Londoners had been killed in the day and night raids since 7 September.

JUNKERS JU 88 BOMBER

One Polish squadron formed during the Battle The Junkers medium bomber became the mainstay of the German bomber force during the Second World War and was also converted to a major role as a night-fighter against the threat of Allied bombing of Germany. Over the course of the war, over 15,000 were produced. Designed in 1936 by the Hugo Junkers company in Dessau, it first flew on 21 December 1936. Its high speed was undermined by insistence from the air force technical office that it should be capable of diving and by the decision to install on-board armament. Technical problems delayed its introduction; too few were available for the Battle of Britain and the Blitz. The night-fighter version was introduced in July 1940. The aircraft was vulnerable to fast modern fighters and 313 were destroyed between July and October 1940, but it later became the backbone of the bomber force as well as a versatile heavy fighter, torpedo-bomber, dive-bomber and reconnaissance aircraft.



BOMB CRATER

Some of the bomb damage from the Blitz included a crater outside Buckingham Palace. Luckily, it only destroyed a part of the wall and little else. This photo was captured on 14 September 1940.

BATTLE OF BRITAIN DAY

15 SEPTEMBER 1940

BELOW: A Luftwaffe Dornier Do 17Z, sometimes known as the "flying pencil" due to its thin frame – an advantage as it was harder to hit than larger heavy bombers. The Dornier was used for both bombing and reconnaissance missions during the battle.

The air battles over southern England on 15 September 1940 have long been commemorated as Battle of Britain Day. At the time it was believed that 185 German aircraft had been destroyed in a single day, making for the largest victory of any day of the battle. Only after the war was it learned that the true figure was just one-third of that number. This nevertheless represented a heavy loss for the German side at a time when its leadership was still hoping that the RAF would be defeated in just a matter of days. The day symbolized the terms of the conflict between the day bombers and the British fighter force, a numerous German enemy against a smaller but well organized defence, and as such it has remained firmly embedded in popular memory ever since.

The weekend of 14–15 September was also popularly regarded as "invasion weekend" in Britain. Troops had been put on high alert a week before, and the Air Ministry issued the "attack imminent" order to put the RAF at a state of readiness to repel invasion. The German air attacks that weekend were thus interpreted as a prelude to a more serious threat, which perhaps explains why the air victories of 15 September were seen at the time as decisive. The German attack that day consisted of two separate assaults on London, aimed at the dock areas, with around 220 bombers supported by larger numbers of fighters from Kesselring's Air Fleet 2. The German commanders also planned small subsidiary attacks on the naval base at Portland and the Spitfire factory at Southampton with aircraft of Air Fleet 3. The first wave of bombers formed up around 11 a.m. over northern France and reached the southern coast around 11.30. This gave Park time to get at least 17 squadrons airborne, with support from neighbouring 10 and 12 Groups, a total of more than 300 fighters.

The bombers and their escort were harried all the way to the target, and many German bombers jettisoned their bomb-loads early or scattered them over southern London. When they reached London, the bombers met a "big wing" formation flown by 12 Group from Duxford, which forced them to shed bombs wherever they could before turning tail. They were then attacked by four more fighter squadrons as they flew back in scattered formation over Kent and Sussex.

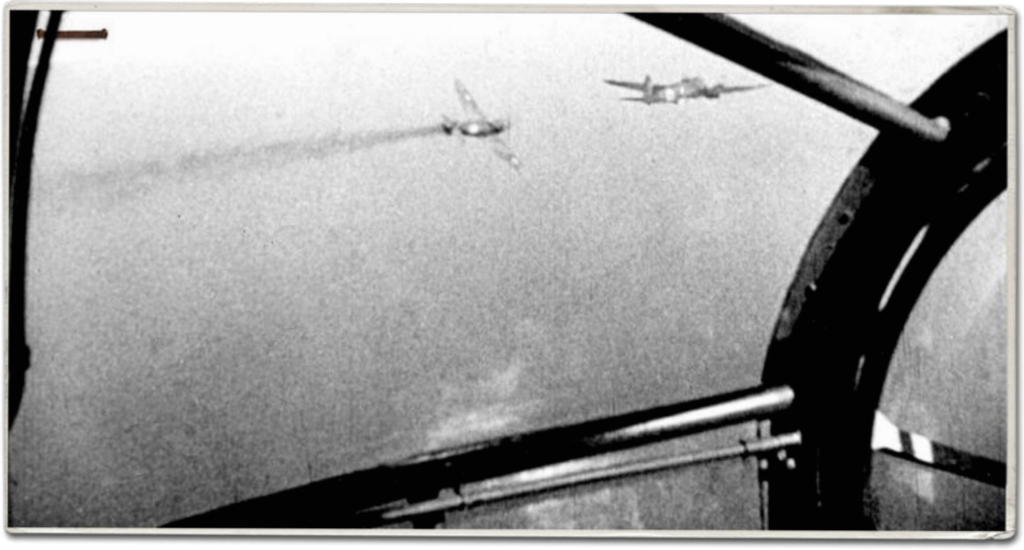
Kesselring then ordered a heavier attack to form up around 2 p.m. Fighter Command had time to refuel and reload and ample warning of the approaching force, an advantage that Kesselring could do little about since his own aircraft needed rest time after the first assault. The losses and damage of German fighter aircraft that morning meant that fewer fighters were available for the second wave, an important factor in the high

FLIGHT LIEUTENANT JOHN MUNGO-PARK (1918–1941)

John Mungo-Park was a descendant of the famous eighteenth-century explorer, Mungo Park. He joined the RAF in 1937, and was posted just after the outbreak of war to 74 Squadron based at Hornchurch in Essex. He was a flamboyant flyer and a popular commander and was one of the top-scoring British aces by the end of the battle, with at least 12 kills to his name. He commanded a squadron flight in September 1940 and took over command of the whole squadron in March 1941. During 1941, he took part in the Fighter Command operations over northern France and Belgium, known as "circuses", and was shot down and killed over the Belgian town of Adinkerke on 27 June 1941.

ABOVE: RAF 66 Squadron pilots wearing their "Mae Wests" (life-jackets) resting in a crew-room between flights during the Battle of Britain. Souvenirs of shot-down planes can be seen on the wall above the fireplace.

BELOW: The Sector "G" Operations Room at Duxford in September 1940. The fighter squadron callsigns can be seen on the wall behind the operator, third from left. The controller is fifth from the left, and on the far right, behind the army liaison officer, are the R/T (Radio Telephone) operators in direct touch with the aircraft.



LEFT: The view from the cockpit of a Heinkel He 111 bomber showing a Spitfire with smoke trailing after being hit in September 1940.

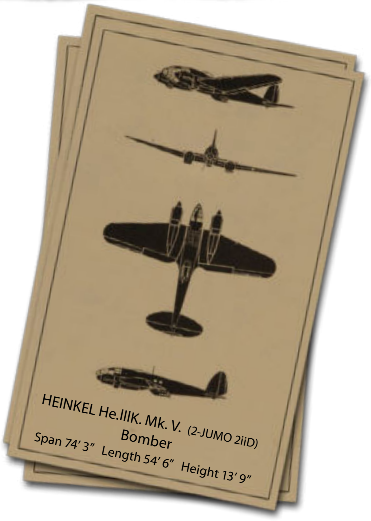
losses sustained by the bombers. This time the German formation was met by more than 25 squadrons of fighters posted in the air above south-eastern England. Fierce dogfights broke out in an increasingly cloudy sky; around 185 bombers reached London and its outskirts but once again the loads were scattered at random to avoid the British fighters. One group of bombers was forced to turn back when the commanding officer of the Northolt sector, Group Captain S. F. Vincent, flying unaccompanied in his Hurricane, appeared and attacked them head-on.

A large amount of damage was done by the bombers that did reach London, but it was widely dispersed, hitting the main residential areas. During the course of the day, Fighter Command lost 26 aircraft and 13 pilots. The enemy lost 36 bombers and 26 fighters destroyed, with a further 20 bombers seriously damaged. This represented a loss of approximately 25 per cent of the bomber force, a rate of attrition that no air force could sustain for more than a few days. The more serious lesson for the German side was the knowledge that the RAF was not only not close to defeat, but was stronger than ever and more tactically experienced than a month before. The following two days' poor weather prevented anything but a few limited operations, but a further daylight operation on 18 September resulted in further heavy losses and the daylight campaign petered out thereafter.

On the British side, the victories of 15 September made it more certain than ever that a German invasion could not be mounted that autumn. Park's tactics to maximize the flexibility of the defence by putting large numbers of paired squadrons in the air ready to intercept the enemy in small groups proved successful enough. The holding back of reserve squadrons to harry the returning bombers or to be thrown into a dangerous point of the battle had also proved its worth. Aircraft production in September exceeded losses by a satisfactory margin, while the number of pilots available by 15 September was the highest since the battle began in July. Battle of Britain Day saw the tide turn decisively in favour of the RAF and marked the end of the major phase of the air war by day.

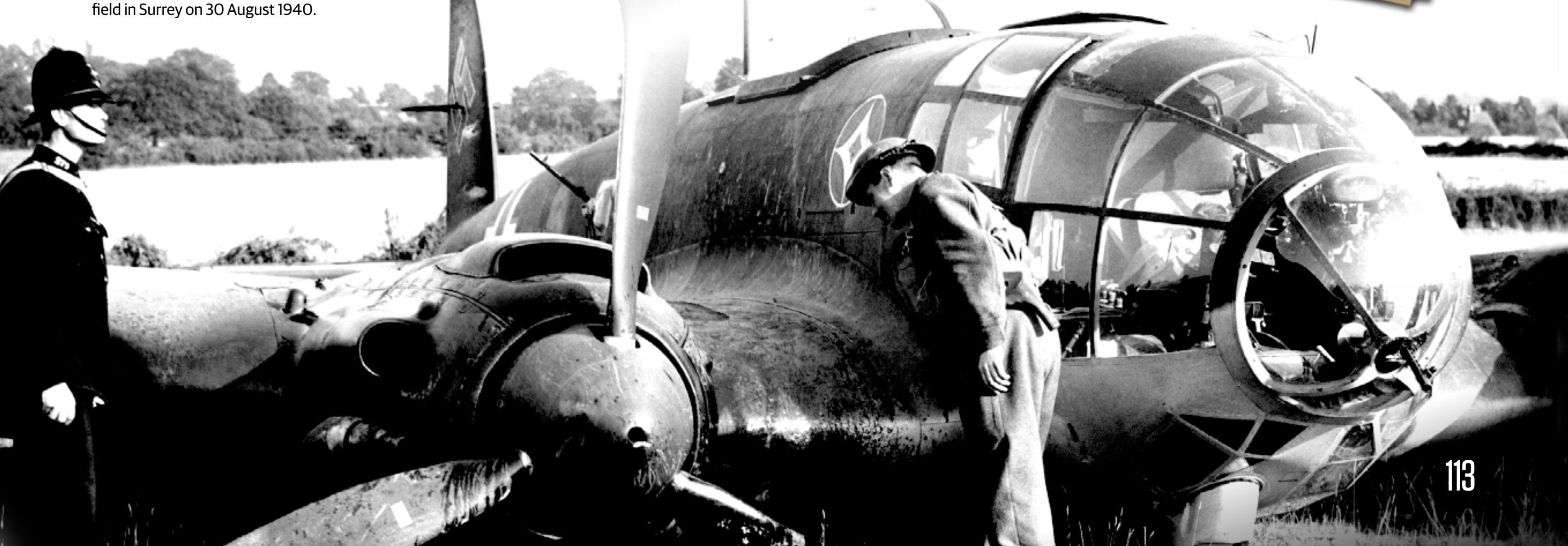
GENERAL ADOLF GALLAND (1912–1996)

Adolf Galland became one of the youngest commanders in the German air force when he was appointed General of Fighters in 1941, a post he held until January 1945. Fascinated from childhood by the idea of flying, he joined the still-secret air force in 1933 and almost ended his career after two serious crashes. He fought in the Condor Legion in the Spanish Civil War, and in the early stages of the Second World War became a highly decorated fighter ace, achieving 58 kills by the end of the Battle of Britain. He was shot down three times in 1941, but survived. In November 1941, he was promoted to General of Fighters and a year later was promoted to major general, when he was forced to stop flying and organize the fighter force. In 1945, after blunt arguments with Goering, he was sacked. Following the war he became an aviation consultant and businessman.



HEINKEL He.IIIK. Mk. V. (2-JUMO 2iiD)
Bomber
Span 74′ 3″ Length 54′ 6″ Height 13′ 9″

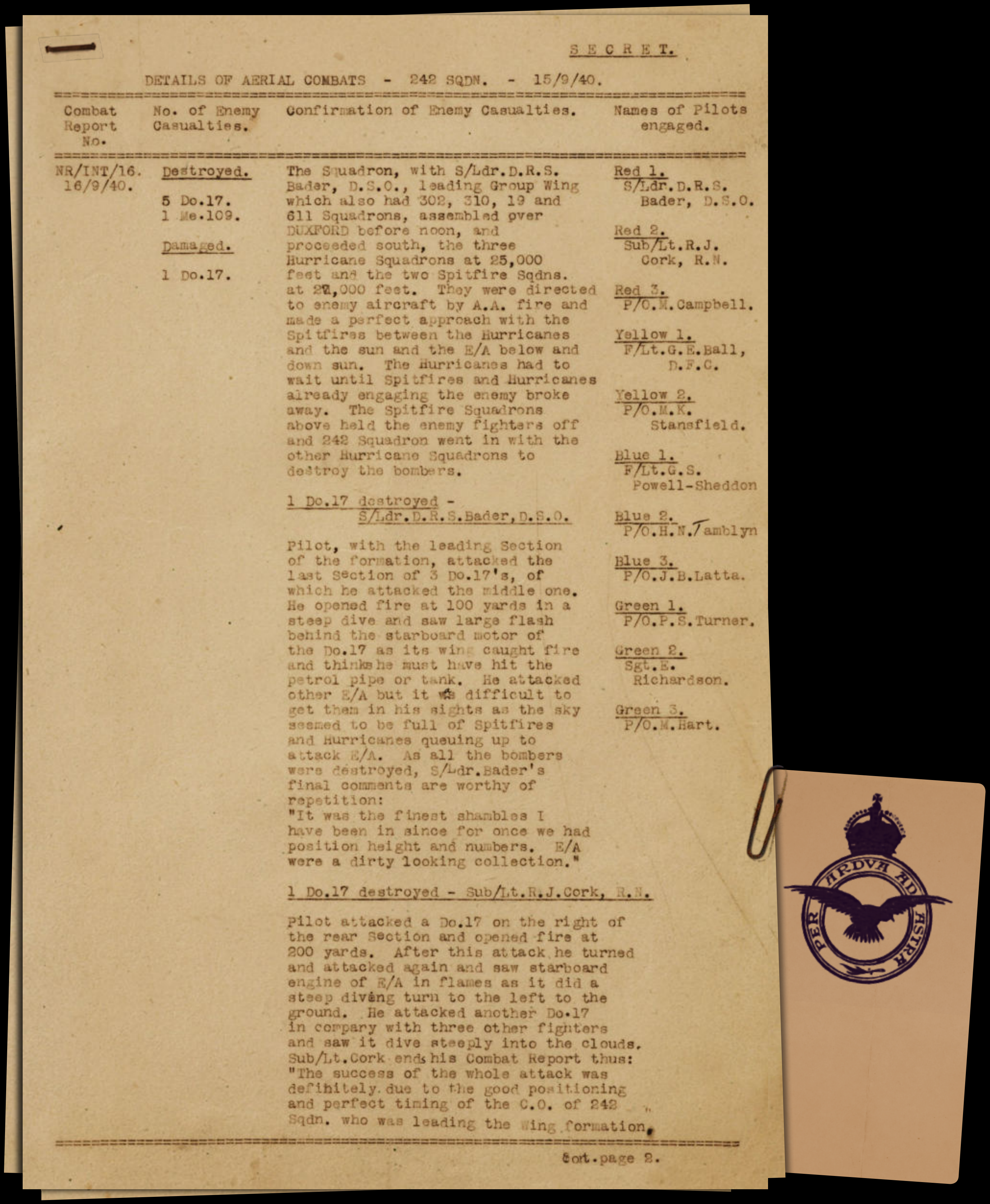
RIGHT: A Heinkel He 111 spotter card.



BELOW: A policeman stands guard as a soldier inspects a Luftwaffe Heinkel He 111K shot down in a field in Surrey on 30 August 1940.

12 GROUP 242 SQUADRON REPORT

This combat report describes the first day of heavy attacks against London, 7 September 1940. It also includes references to the flamboyant Squadron Leader Douglas Bader.

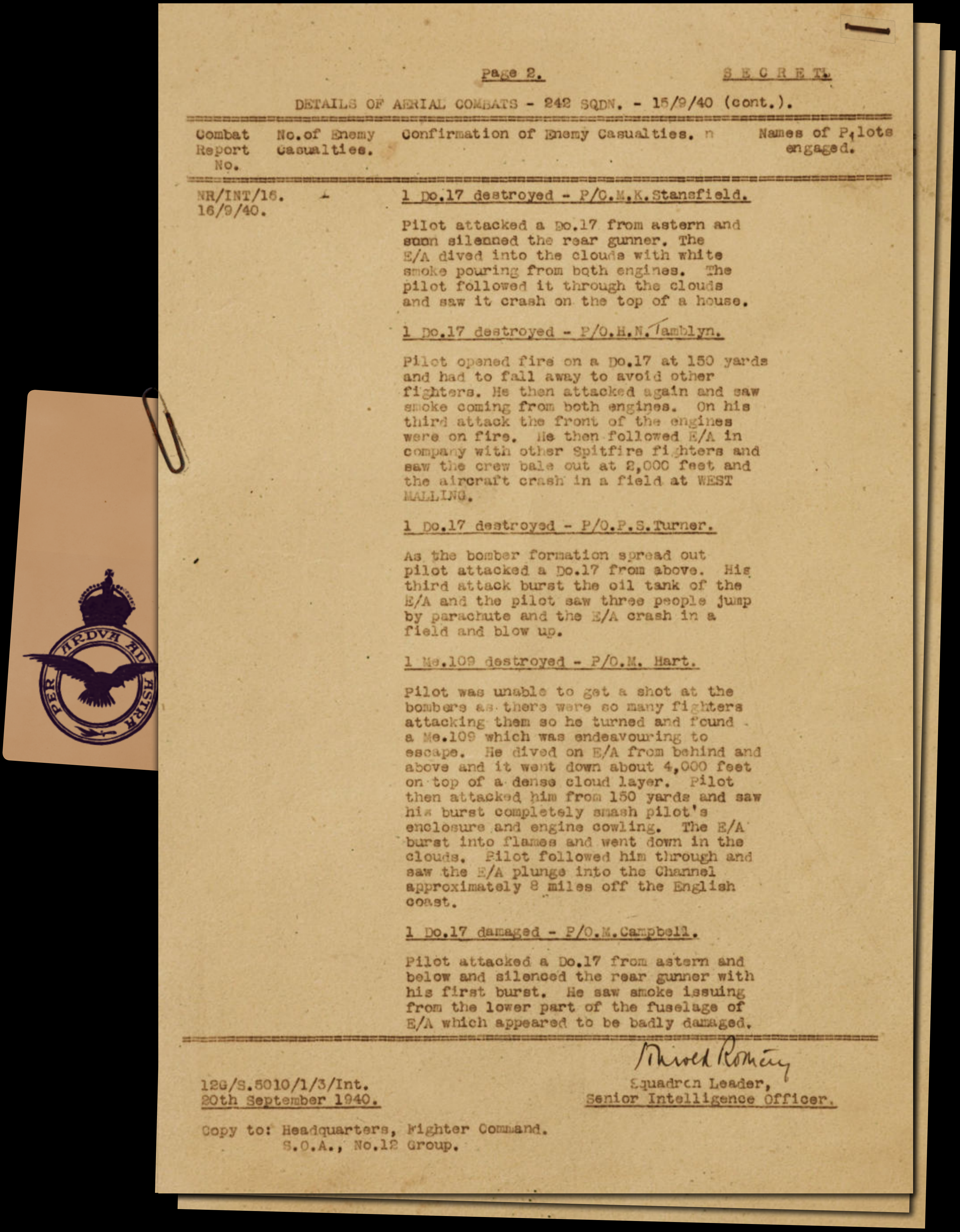


SECRET.

DETAILS OF AERIAL COMBATS - 242 SQDN. - 15/9/40.

Combat Report No.	No. of Enemy Casualties.	Confirmation of Enemy Casualties.	Names of Pilots engaged.
NR/INT/16. 16/9/40.	Destroyed. 5 Do.17. 1 Me.109. Damaged. 1 Do.17.	The Squadron, with S/Ldr.D.R.S. Bader, D.S.O., leading Group Wing which also had 302, 310, 19 and 611 Squadrons, assembled over DUXFORD before noon, and proceeded south, the three Hurricane Squadrons at 25,000 feet and the two Spitfire Sqdns. at 27,000 feet. They were directed to enemy aircraft by A.A. fire and made a perfect approach with the Spitfires between the Hurricanes and the sun and the E/A below and down sun. The Hurricanes had to wait until Spitfires and Hurricanes already engaging the enemy broke away. The Spitfire Squadrons above held the enemy fighters off and 242 Squadron went in with the other Hurricane Squadrons to destroy the bombers. 1 Do.17 destroyed - S/Ldr.D.R.S.Bader,D.S.O. Pilot, with the leading Section of the formation, attacked the last Section of 3 Do.17's, of which he attacked the middle one. He opened fire at 100 yards in a steep dive and saw large flash behind the starboard motor of the Do.17 as its wing caught fire and thinks he must have hit the petrol pipe or tank. He attacked other E/A but it was difficult to get them in his sights as the sky seemed to be full of Spitfires and Hurricanes queuing up to attack E/A. As all the bombers were destroyed, S/Ldr.Bader's final comments are worthy of repetition: "It was the finest shambles I have been in since for once we had position height and numbers. E/A were a dirty looking collection." 1 Do.17 destroyed - Sub/Lt.R.J.Cork, R.N. Pilot attacked a Do.17 on the right of the rear Section and opened fire at 200 yards. After this attack he turned and attacked again and saw starboard engine of E/A in flames as it did a steep diving turn to the left to the ground. He attacked another Do.17 in company with three other fighters and saw it dive steeply into the clouds. Sub/Lt.Cork ends his Combat Report thus: "The success of the whole attack was defihitely due to the good positioning and perfect timing of the C.O. of 242 Sqdn. who was leading the Wing formation."	Red 1. S/Ldr.D.R.S. Bader, D.S.O. Red 2. Sub/Lt.R.J. Cork, R.N. Red 3. P/O.M.Campbell. Yellow 1. F/Lt.G.E.Ball, D.F.C. Yellow 2. P/O.M.K. Stansfield. Blue 1. F/Lt.G.S. Powell-Sheddon Blue 2. P/O.H.N.Tamblyn Blue 3. P/O.J.B.Latta. Green 1. P/O.P.S.Turner. Green 2. Sgt.E. Richardson. Green 3. P/O.M.Hart.

Cont.page 2.



Page 2. SECRET.

DETAILS OF AERIAL COMBATS - 242 SQDN. - 15/9/40 (cont.).

Combat Report No.	No.of Enemy Casualties.	Confirmation of Enemy Casualties.	Names of Pilots engaged.
NR/INT/16. 16/9/40.	-	1 Do.17 destroyed - P/O.M.K.Stansfield.	

Pilot attacked a Do.17 from astern and soon silenced the rear gunner. The E/A dived into the clouds with white smoke pouring from both engines. The pilot followed it through the clouds and saw it crash on the top of a house.

1 Do.17 destroyed - P/O.H.N.Tamblyn.

Pilot opened fire on a Do.17 at 150 yards and had to fall away to avoid other fighters. He then attacked again and saw smoke coming from both engines. On his third attack the front of the engines were on fire. He then followed E/A in company with other Spitfire fighters and saw the crew bale out at 2,000 feet and the aircraft crash in a field at WEST MALLING.

1 Do.17 destroyed - P/O.P.S.Turner.

As the bomber formation spread out pilot attacked a Do.17 from above. His third attack burst the oil tank of the E/A and the pilot saw three people jump by parachute and the E/A crash in a field and blow up.

1 Me.109 destroyed - P/O.M. Hart.

Pilot was unable to get a shot at the bombers as there were so many fighters attacking them so he turned and found a Me.109 which was endeavouring to escape. He dived on E/A from behind and above and it went down about 4,000 feet on top of a dense cloud layer. Pilot then attacked him from 150 yards and saw his burst completely smash pilot's enclosure and engine cowling. The E/A burst into flames and went down in the clouds. Pilot followed him through and saw the E/A plunge into the Channel approximately 8 miles off the English coast.

1 Do.17 damaged - P/O.M.Campbell.

Pilot attacked a Do.17 from astern and below and silenced the rear gunner with his first burst. He saw smoke issuing from the lower part of the fuselage of E/A which appeared to be badly damaged.

12G/S.5010/1/3/Int.
20th September 1940.

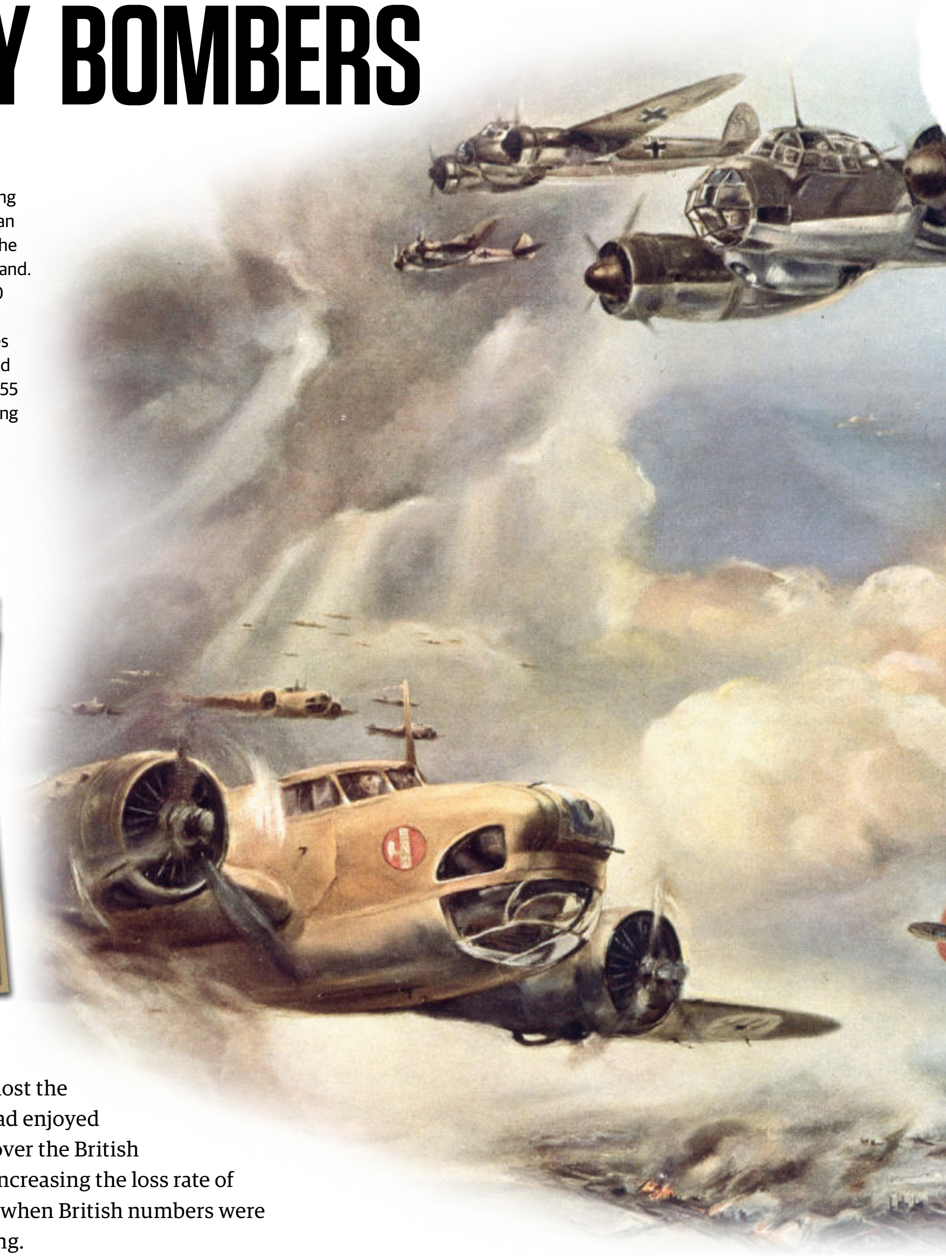
Squadron Leader,
Senior Intelligence Officer.

Copy to: Headquarters, Fighter Command.
S.O.A., No.12 Group.

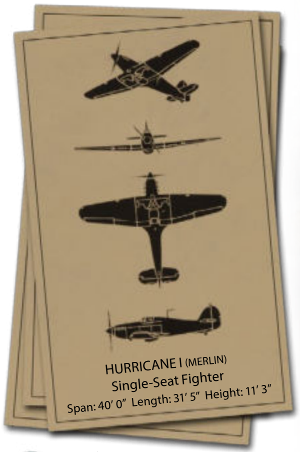
RECYCLING WRECKAGE

What looks like a scrapyard was actually an important resource. Downed German aircraft were recycled, and equipment was inspected to see what could be learned.

DEFEAT OF THE DAY BOMBERS


RIGHT: A 1940 painting by Hans Liska of German and Italian bombers, The Fasces flying over England. The Italian Breda BR20 bombers (foreground) were stationed at bases in Belgium but achieved little, dropping a mere 55 tons of bombs and losing 8 aircraft.

The onset of a daylight bombing campaign on 7 September forced both sides to reconsider the way the battle was being fought. Over the following week, the attacks by day continued despite mounting German losses, while at night attacks against industrial and utility targets carried on. By the end of the month, large daylight raids had become so dangerous for the German air fleets that they were finally largely abandoned by early October and the bombing effort switched to night attacks.



BELOW: A Hurricane information card.

Between 7 September and 5 October there were 35 major raids, 18 of them against London, the heaviest of these on 15 September. German bomber leaders insisted that they had to have a heavy fighter escort to avoid the high attrition rate suffered during the August attacks against airfields. German fighters were ordered not only to fly in front of and above the bomber stream, but also to weave in and out of the stream itself. The slow bomber speeds forced the guarding fighters to fly a zig-zag course, using up fuel needed for combat. Although the tactic generally allowed some of the bombers to reach their destination, German fighters lost the flexibility they had enjoyed in the dogfights over the British fighter stations, increasing the loss rate of fighters at a time when British numbers were steadily expanding.

MARSHAL OF THE RAF SIR CHARLES PORTAL (1893–1971)

During the critical weeks of the Battle of Britain, Charles Portal was commander-in-chief of RAF Bomber Command, a post he assumed in April 1940. He began studying law in 1912, but volunteered as a dispatch rider in the Royal Engineers in 1914. A year later he joined the Royal Flying Corps and, after a distinguished wartime career, joined the infant RAF in 1919. He became director of organization in the Air Ministry from 1937–39 and was air member for personnel when he was posted to Bomber Command. An enthusiast for long-range bombing, he oversaw the first tentative attacks on German targets during the summer and autumn of 1940. In October that year, he became Chief of the Air Staff and held the post until 1945. In 1944 he was created Marshal of the Royal Air Force. After the war he played a part in the British nuclear energy programme and was later chairman of the British Aircraft Corporation from 1960–68.

Park devised a new approach to the bombing attacks. Since the German operations were consistently mounted in three waves, Park ordered 11 Group to keep six squadrons airborne to meet the first wave, a second eight squadrons to attack the next one, and the remaining squadrons to attack the third and to protect vulnerable targets. The fighters of 10 and 12 Groups were responsible for defending the airfields and facilities of 11 Group. To make sure there was time to get airborne to a sufficient height, fighter squadrons were drawn further back from the coast to give them time to assemble. By relaying false height references over the radio, they were able to draw German fighters to lower levels and then to attack them from above. Hurricanes were detailed to concentrate on the bombers, Spitfires on German fighters. The new tactics immediately reduced Fighter Command losses, while the German bomber force lost 199 aircraft in the first week of attacks. In total, the German air force lost 298 aircraft in a week, a rate that could not

BELOW: Hermann Goering on a visit to the Channel Coast in September 1940 to receive reports about the bombing campaign. Behind him is Major General Karl Bodenschatz, the liaison officer between the air force and Hitler's supreme headquarters; to his right is Field Marshal Kesselring.

EVACUATION

Long before the outbreak of war, the British government began to plan the evacuation of children and mothers from the main urban areas threatened by bombing. By the outbreak of war the plan was to move up to four million people from their homes. In the end only one-and-a-half million left on government schemes, with an estimated two million leaving voluntarily. Millions returned once it became clear that there would be no bombing. When the attacks on London started in September 1940, the government organized a second wave of evacuees, but only 20,500 children were moved out of London that month and a year later the figure was still only 60,000. Many families preferred to stay together and resisted evacuation plans, with the result that there was heavy loss of life among women and children during the winter of 1940–41. Evacuees were placed with foster families in less threatened areas, though this did not guarantee safety. Thousands were moved to Devon, but the bombing of Exeter in April and May of 1942 resulted in the death of a number of those evacuated there during the Blitz.

possibly be sustained. On 9 September, the next time a heavy attack was mounted after the big raid of the 7th, the bomber stream was diverted or turned back, and only around 90 bombers reached London. That day, 28 German aircraft were lost for the loss of 19 RAF fighters. The pattern persisted for much of September.

The German side switched to diversionary fighter sweeps, or attacks with small numbers of fighter-bombers to confuse the opposition. Operations were mounted with smaller numbers of bombers and larger numbers of fighters in order to draw Fighter Command into unequal combat. Attacks continued against London, but were also carried out against aircraft production in Southampton, Bristol and elsewhere. On 30 September, three waves of attack were mounted against London with diversionary raids elsewhere, but the defences destroyed 47 German aircraft for the loss of only 20. The German commanders at last drew the obvious lesson that Fighter Command had never been defeated, and that the high bomber losses which resulted made daylight bombing too expensive to continue. From early October onwards, the day assault was ended and the night time Blitz began in earnest.

ABOVE: A bomb crater outside the gates of Buckingham Palace on 14 September 1940. The bomb destroyed railings but otherwise did very little damage.

BELOW: Firemen and air raid precaution workers survey the wreckage of a German plane which crashed on to Victoria Station in London during the air battles in mid-September. Victoria was rendered inoperable on several occasions during the Blitz.

BELOW: A still from a news film of German crew beside their crashed German bomber at West Malling, Kent in September 1940. In the first week of the bomber offensive the German air force lost 199 bombers.

BIG WINGS

One of the major controversies provoked by combat in the Battle of Britain was over the optimum size of the units Fighter Command put into the air to meet enemy aircraft. So serious did the arguments become that what was known as the "Big Wing" controversy cost Keith Park his job as commander of 11 Group and contributed to the efforts to remove Dowding from overall command.

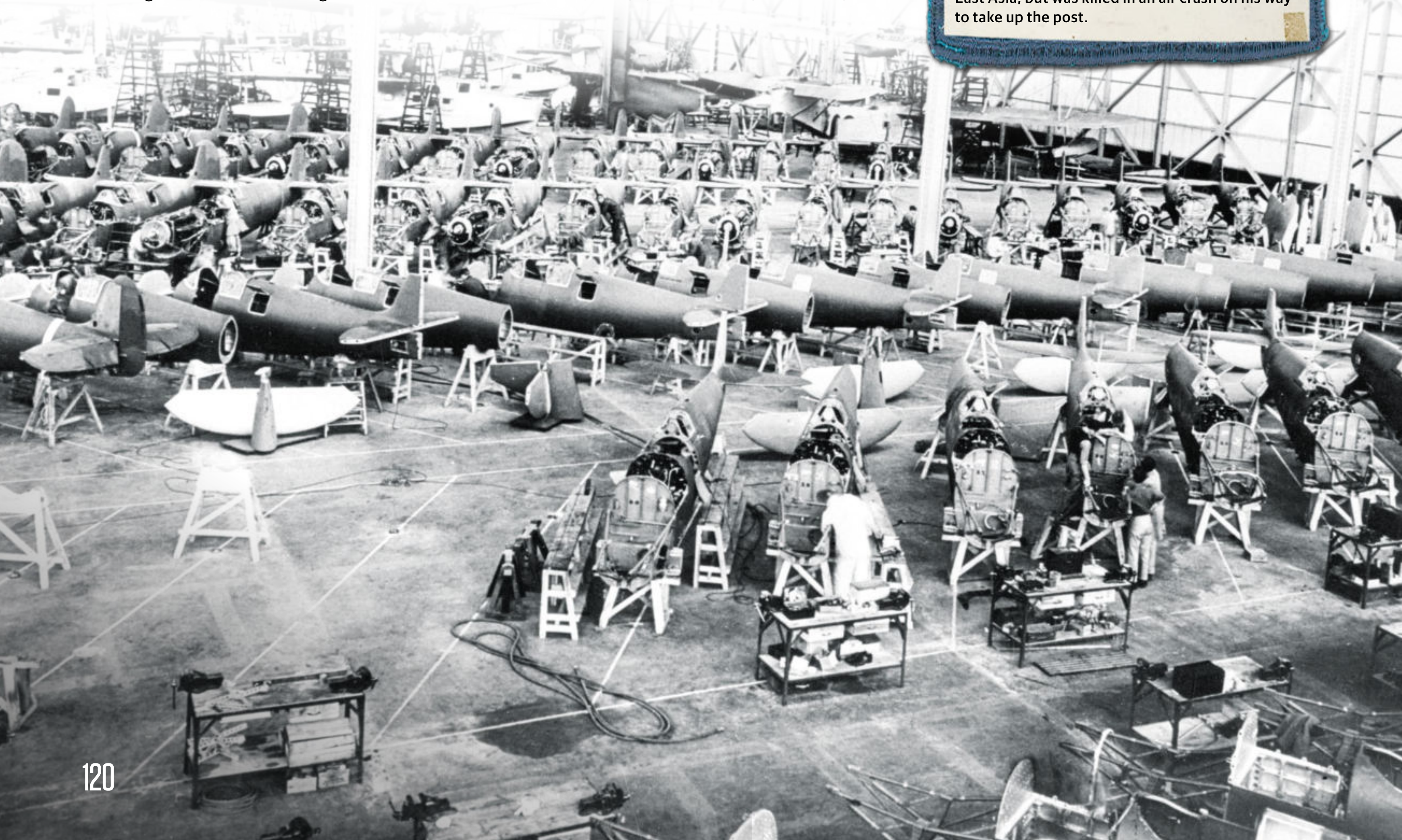
The origins of the controversy were to be found in the sector stations of 12 Group and in particular the Duxford station, where Douglas Bader was a squadron commander. Bader and his fellow pilots were frustrated during the main part of the battle at having to guard northern airfields and installations rather than fight in the thick of the combat in "Hell's Corner" in Kent and Sussex. This was a view shared by the commander of 12 Group, Air Vice Marshal Trafford Leigh-Mallory, who resented the fact that Park, as commander of 11 Group, was in the thick of the fight. Bader developed the idea that by scrambling at least three squadrons together it would be possible to attack the enemy in real strength. These "Big Wings" would be assembled north of London at a height necessary to give the fighters the advantage, and then thrown against the bomber streams either as they attacked or, more probable given the distances involved, when they were in retreat.

During the attacks on the fighter stations of 11 Group, Park had many times asked Leigh-Mallory to provide one or two squadrons to protect the more northerly airfields. In a number of cases the 12 Group squadrons had failed to appear. Instead they were assembled in large wings of up to five squadrons, which took a considerable time, and sent out to engage enemy formations in 11 Group's airspace. On 17 September, Leigh-Mallory submitted an exaggerated report to the Air Ministry claiming that in five such "Big Wing" operations, 163 enemy aircraft had been accounted for, for the loss of only 14 fighters and six pilots. He found allies in the Air Ministry, particularly Sholto Douglas, the assistant chief of staff. Harold Balfour, Under Secretary of State for Air, provided political support. During the last part of September and early October, strong criticism emerged of Park's tactics which he had little time to contest.

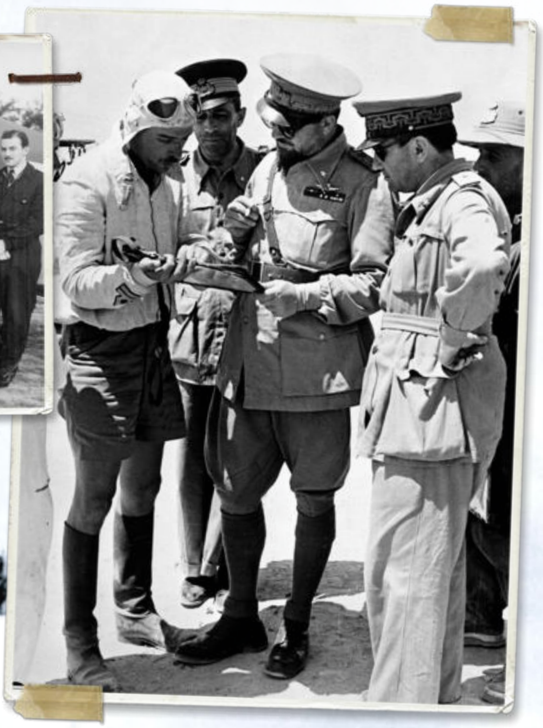
AIR VICE-MARSHAL SIR TRAFFORD LEIGH-MALLORY (1892–1944)

Commander of 12 Group during the Battle of Britain, Leigh-Mallory went on to become commander-in-chief of the Allied Expeditionary Air Force for the invasion of Normandy. He joined the Royal Flying Corps in the First World War and then stayed in the post-war RAF. In 1938, he was appointed to command 12 Group in Fighter Command and retained his command throughout the Battle of Britain. In December 1940, he succeeded Park as commander of 11 Group. In November 1942, he became commander-in-chief of Fighter Command and then of the D-Day air forces. In October 1944, he was posted to South-East Asia, but was killed in an air crash on his way to take up the post.

BELOW: The floor of a Spitfire factory in the summer of 1940. The high supply of fighter aircraft (over 1,900 during the months of the battle) ensured that Fighter Command could endure the attrition rates of battle and encouraged some commanders to think about operating fighters in much larger numbers together



ABOVE: Douglas Bader in 1940 at Duxford relaxing with crew in front of a Hurricane. Bader was the principal spokesman for the idea of "Big Wings".



ABOVE: Hurricanes of 12 Group's 85 Squadron from Church Fenton in north Yorkshire in flight on 23 October 1940. The larger formations were supposed to be able to inflict heavier damage on attacking aircraft but the evidence remained ambiguous.

ABOVE: A group of Italian airmen in North Africa in discussion with General Italo Balbo in 1940. "Big Wings" were also known by the nickname "Balbos" because of the Italian commander's reputation for leading large air units.

ABOVE: The station orderly room at RAF Duxford in Cambridgeshire with RAF, WAAF and civilian clerks at work. Duxford was at the heart of the campaign for Big Wings.

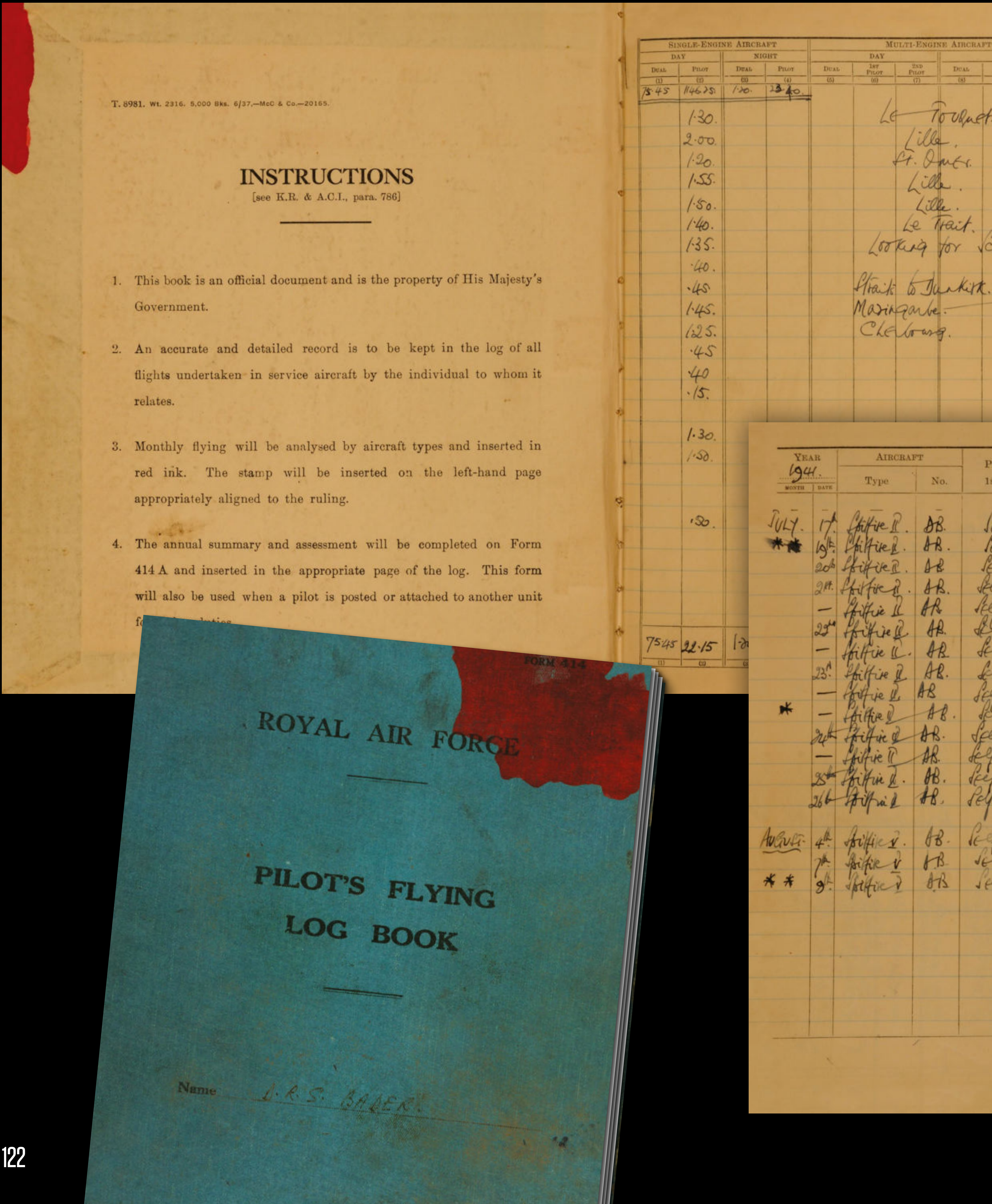
Park had been compelled by the scattered nature of German objectives and the size of his force to operate squadrons in pairs. The difficulty of ensuring rendezvous meant that squadrons on many occasions intercepted the enemy on their own. But using his aircraft in small groups meant that every element of a German attack could be opposed, while allowing some reserve squadrons to be held back to throw into the most dangerous parts of the battle. This system had worked well with the help of aircraft from 10 Group, which had protected sector stations. 12 Group, on the other hand, had been reluctant to supply help and on occasion arrived only after a fighter station had already been bombed. Park's complaints about Leigh-Mallory prompted a high-level conference at the Air Ministry on 17 October at which all the issues were thrashed out. Leigh-Mallory defied protocol by bringing with him Douglas Bader, a junior officer, and at the meeting Bader's claims were used by Park's critics as the basis for a comprehensive rejection of his tactics. There followed a month's campaign in the Air Ministry to champion the idea of "Big Wings" and to remove Park from command.

During late September and October, Leigh-Mallory failed to co-operate effectively with 11 Group. For almost a month the "Big Wings" regularly sent south from 12 Group's sector stations failed to engage the enemy once. A classic example was the German attack on 29 October when Park called for 12 Group wings to intercept raids in the morning and late afternoon. On both occasions the wings took so long to assemble that they failed to intercept while Park had 17 squadrons airborne at the critical moment. None of these failings could dissuade those hostile to Park (and increasingly hostile to Dowding as well) from the idea that using fighters in large numbers represented a tactical advantage. In November, Park was notified that he was to be relieved as commander of 11 Group, to be replaced by Leigh-Mallory. Dowding had already been informed that he was to be stood down from the RAF and his replacement would be Sholto Douglas, leading spokesman of the campaign against Park.

During 1941 Douglas and Leigh-Mallory had the opportunity to use "Big Wings" in regular fighter assaults on northern Europe generally known as "Circuses". The outcome was an exceptionally high level of casualties, with a 44 per cent rate of loss over the two years of the campaign. The results demonstrated that aggressively large numbers of fighters did not necessarily represent a tactical advantage, as Park had argued all along.

WING COMMANDER DOUGLAS BADER (1910–1982)

The son of a soldier, Douglas Bader was one of a generation of young university graduates attracted into a career in flying. He joined the RAF in 1928 but was invalided out after crashing his plane late in 1931 and losing both legs. He proved able to fly with artificial limbs, and on the outbreak of war in 1939 managed to persuade the RAF to reinstate him. He became a squadron leader in June 1940 and was posted to Duxford air base in command of a squadron of Hurricanes during the Battle of Britain. He shot down his first German aircraft of the battle in July. He was an inspirational commander and a fine pilot, recording at least 22 kills. In August 1941, he was shot down in a raid over France. He tried to escape from German POW camps on a number of occasions and was eventually incarcerated in Colditz Castle from where he was liberated in April 1945.



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INSTRUCTIONS

[see K.R. & A.C.I., para. 786]

1. This book is an official document and is the property of His Majesty's Government.

2. An accurate and detailed record is to be kept in the log of all flights undertaken in service aircraft by the individual to whom it relates.

3. Monthly flying will be analysed by aircraft types and inserted in red ink. The stamp will be inserted on the left-hand page appropriately aligned to the ruling.

4. The annual summary and assessment will be completed on Form 414 A and inserted in the appropriate page of the log. This form will also be used when a pilot is posted or attached to another unit

Single-Engine Aircraft				Multi-Engine Aircraft			
Day		Night		Day			
Dual (1)	Pilot (2)	Dual (3)	Pilot (4)	Dual (5)	1st Pilot (6)	2nd Pilot (7)	Dual (8)
75.45	1146.25	1.20.	23.40.				
	1.30.				Le Touquet		
	2.00.				Lille.		
	1.20.				St. Omer.		
	1.55.				Lille.		
	1.50.				Lille.		
	1.40.				Le Trait.		
	1.35.				Looking for		
	.40.						
	.45				Straits to Dunkirk.		
	1.45.				Maringarbe.		
	1.25.				Cherbourg.		
	.45						
	.40						
	.15.						
	1.30.						
	1.50.						
	.50.						
75.45	22.15	1.20					

Year 1941. Month	Date	Aircraft Type	No.
July.	17th.	Spitfire II.	AB.
**	19th.	Spitfire II.	AB.
	20th	Spitfire II.	AB
	21st.	Spitfire II.	AB.
	—	Spitfire II	AB
	22nd	Spitfire II.	AB.
	—	Spitfire II.	AB.
	23rd.	Spitfire II	AB.
	—	Spitfire II	AB
*	—	Spitfire II	AB.
	24th	Spitfire II	AB.
	—	Spitfire II	AB.
	25th	Spitfire II.	AB.
	26th	Spitfire II	AB.
August.	4th.	Spitfire V.	AB.
	7th.	Spitfire V	AB
**	9th.	Spitfire V	AB

FORM 414

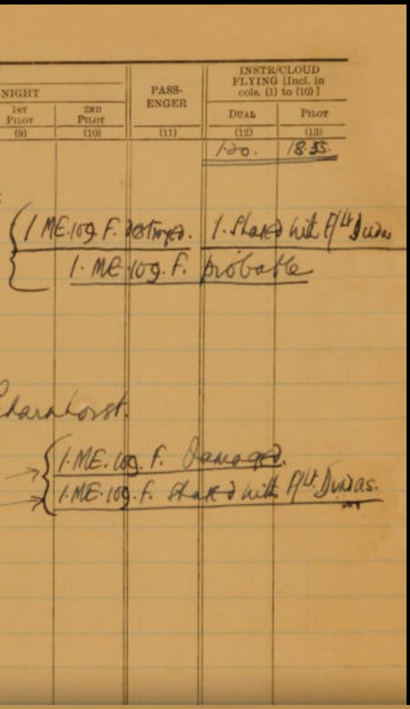
ROYAL AIR FORCE

PILOT'S FLYING LOG BOOK

Name D.R.S. BADER.

SQUADRON LEADER DOUGLAS BADER'S LOGBOOK

Extract from the logbook of Squadron Leader Douglas Bader. It refers to the "Big Wings" which Bader tried to champion in September and October 1940. Large fighter groups were used in 1941 in intruder operations over northern Europe.

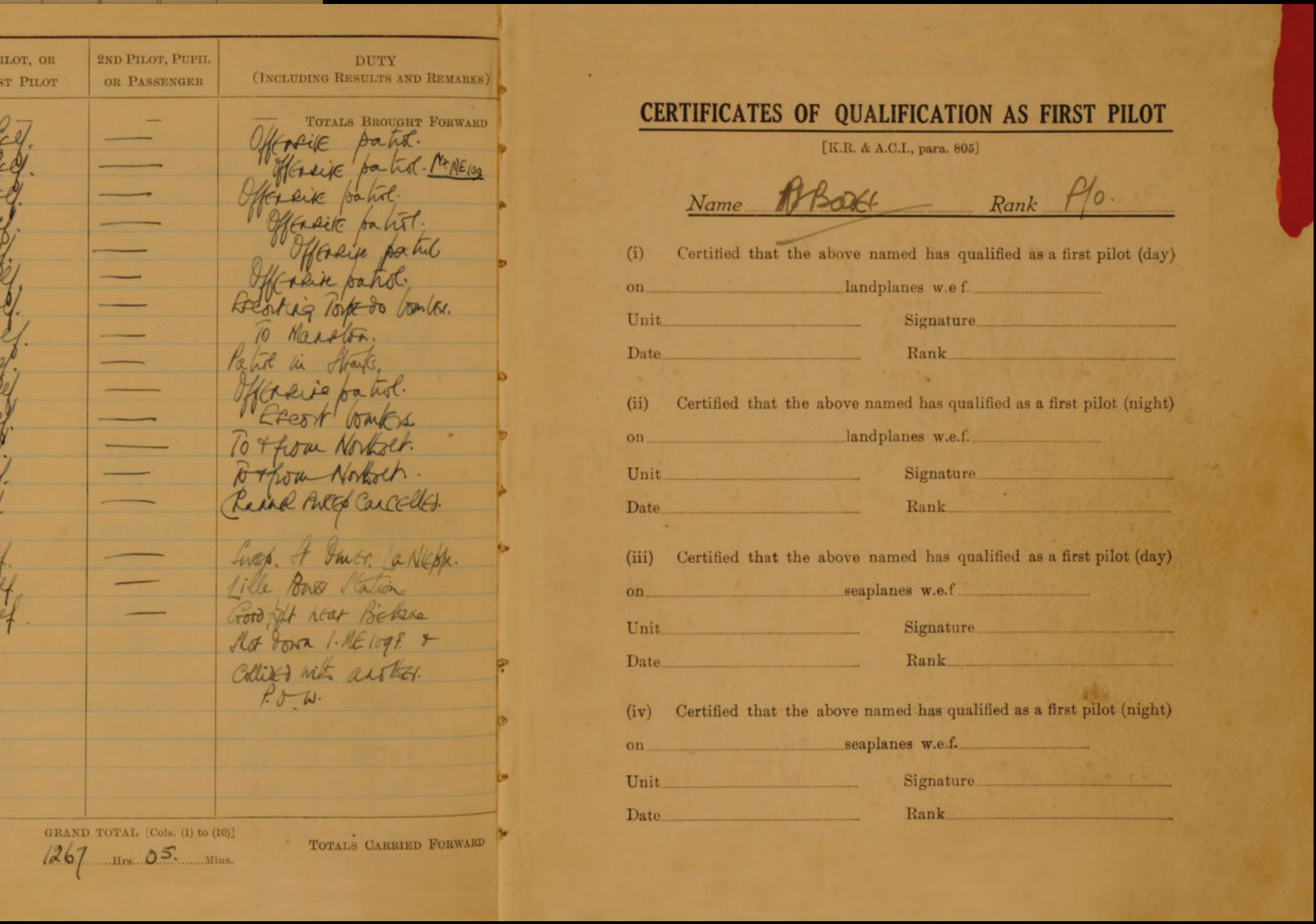


NIGHT 1ST PILOT (9)	NIGHT 2ND PILOT (10)	PASSENGER (11)	INSTR/CLOUD FLYING [Incl. in cols. (1) to (10)] DUAL (12)	INSTR/CLOUD FLYING [Incl. in cols. (1) to (10)] PILOT (13)
			1·00.	18·55.

1 ME 109 F. destroyed. 1. Shared with F/Lt Dundas
1. ME 109. F. probable

Scharnhorst.

1. ME. 109. F. Damaged.
1. ME. 109. F. Shared with F/Lt. Dundas.



ILOT, OR ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)
	—	— TOTALS BROUGHT FORWARD
	—	Offensive patrol.
	—	Offensive patrol. 1 ME 109
	—	Offensive patrol.
	—	Offensive patrol.
	—	Offensive patrol
	—	Offensive patrol.
	—	Escorting Torpedo bombers.
	—	To Manston.
	—	Patrol in Straits.
	—	Offensive patrol.
	—	Escort bombers.
	—	To & from Northolt.
	—	To & from Northolt.
	—	Ramrod Attack Cancelled.
	—	Sweep. St Omer. La Nieppe.
	—	Lille Power Station.
	—	Good fight near Bethune
		Shot down 1. ME 109 F. &
		Collided with another.
		P.O.W.

GRAND TOTAL [Cols. (1) to (10)]
1267 Hrs. 05 Mins.

TOTALS CARRIED FORWARD

CERTIFICATES OF QUALIFICATION AS FIRST PILOT

[K.R. & A.C.I., para. 805]

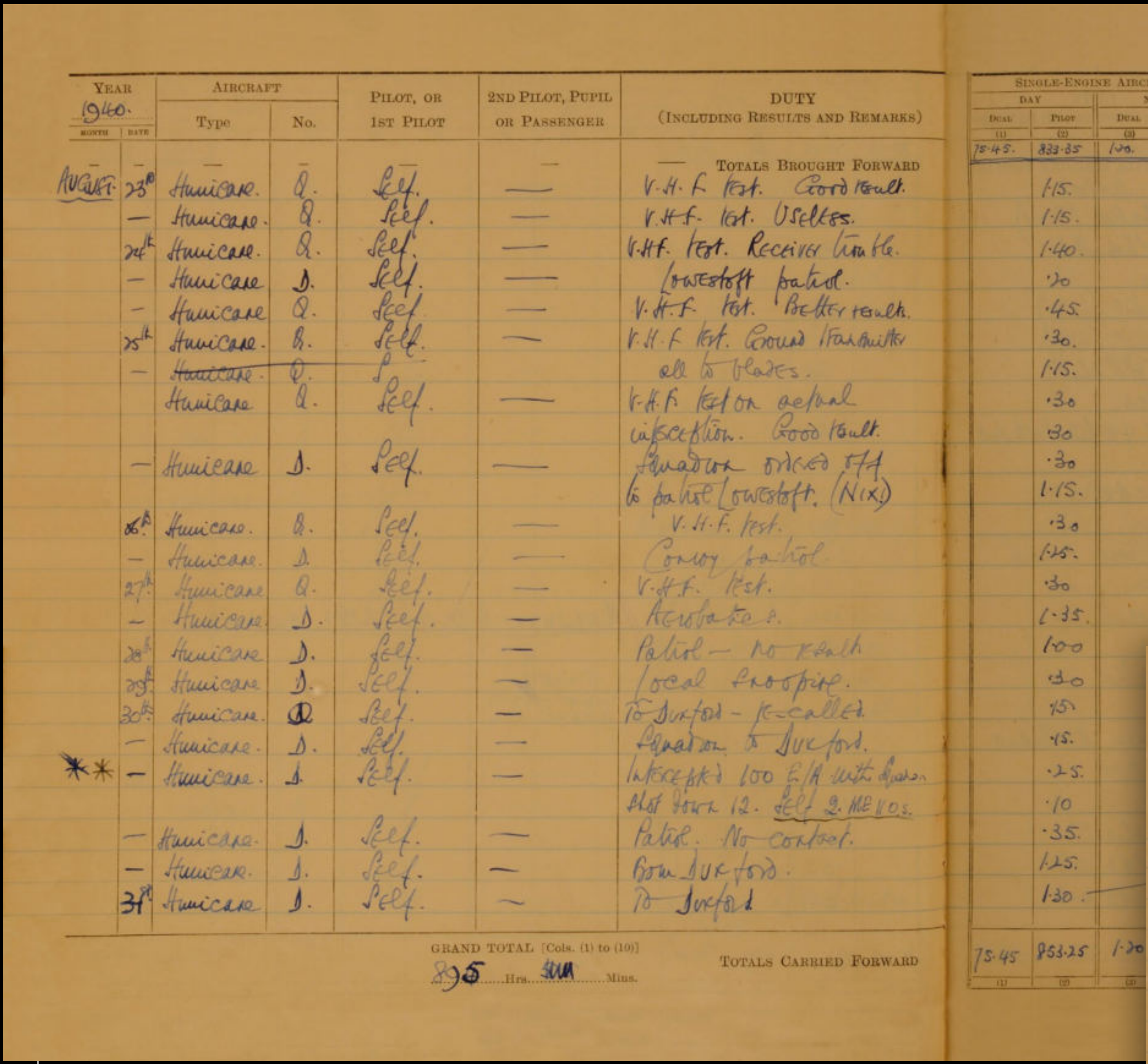
Name D Bader Rank P/O.

(i) Certified that the above named has qualified as a first pilot (day)
on .... landplanes w.e.f. ....
Unit .... Signature ....
Date .... Rank ....

(ii) Certified that the above named has qualified as a first pilot (night)
on .... landplanes w.e.f. ....
Unit .... Signature ....
Date .... Rank ....

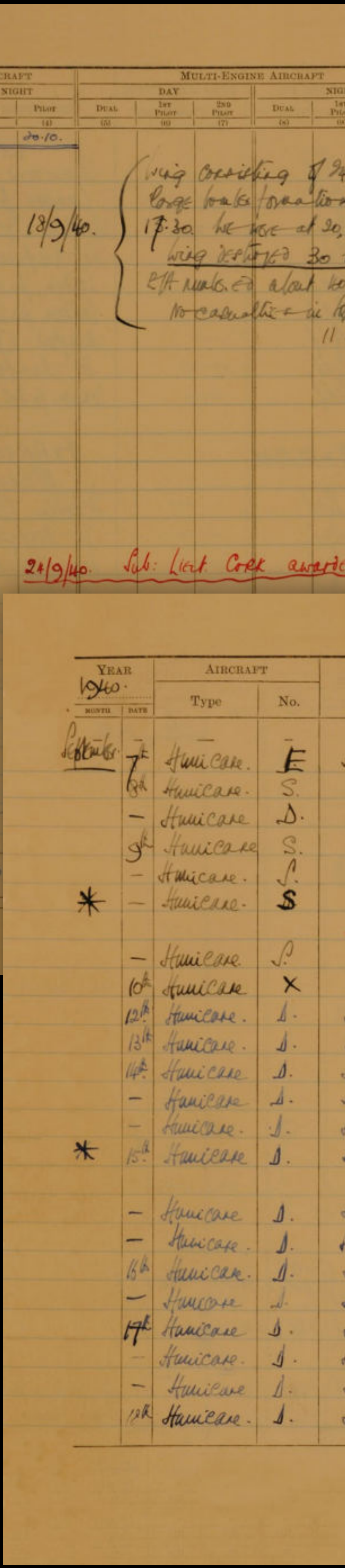
(iii) Certified that the above named has qualified as a first pilot (day)
on .... seaplanes w.e.f. ....
Unit .... Signature ....
Date .... Rank ....

(iv) Certified that the above named has qualified as a first pilot (night)
on .... seaplanes w.e.f. ....
Unit .... Signature ....
Date .... Rank ....



YEAR 1940 MONTH	DATE	AIRCRAFT Type	No.	PILOT, OR 1ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)	SINGLE-ENGINE AIRCRAFT DAY DUAL (1)	PILOT (2)	NIGHT DUAL (3)	PILOT (4)
—	—	—	—	—	—	TOTALS BROUGHT FORWARD	75·45.	833·35	1·20.	20·10.
August	23rd	Hurricane.	Q.	Self.	—	V.H.F test. Good result.		1·15.		
	—	Hurricane.	Q.	Self.	—	V.H.F. test. Useless.		1·15.		
	24th	Hurricane.	Q.	Self.	—	V.H.F. test. Receiver trouble.		1·40.		
	—	Hurricane	D.	Self.	—	Lowestoft patrol.		·20		
	—	Hurricane	Q.	Self	—	V.H.F. test. Better result.		·45.		
	25th	Hurricane.	Q.	Self.	—	V.H.F test. Ground transmitter		·30.		
	—	~~Hurricane.~~	~~Q.~~	~~S~~		all to blazes.		1·15.		
		Hurricane	Q.	Self.	—	V.H.F test on actual		·30		
						interception. Good result.		·30		
	—	Hurricane	D.	Self.	—	Squadron ordered off		·30		
						to patrol Lowestoft. (Nix!)		1·15.		
	26th	Hurricane.	Q.	Self.	—	V.H.F. test.		·30		
	—	Hurricane.	D.	Self.	—	Convoy patrol		1·25.		
	27th	Hurricane	Q.	Self.	—	V.H.F. test.		·30		
	—	Hurricane.	D.	Self.	—	Aerobatics.		1·35.		
	28th	Hurricane	D.	Self.	—	Patrol — no result		1·00		
	29th	Hurricane	D.	Self.	—	Local troopsite.		·30		
	30th	Hurricane.	Q	Self.	—	To Duxford — recalled.		·15		
	—	Hurricane.	D.	Self.	—	Squadron to Duxford.		·15.		
**	—	Hurricane.	D.	Self.	—	Intercepted 100 E/A with Squadron		·25.		
						shot down 12. Self 2. ME 110s.		·10		
	—	Hurricane.	D.	Self.	—	Patrol. No contact.		·35.		
	—	Hurricane.	D.	Self.	—	From Duxford.		1·25.		
	31st	Hurricane	D.	Self.	—	To Duxford		1·30.		
						TOTALS CARRIED FORWARD	75·45	853·25	1·20	
							(1)	(2)	(3)	

GRAND TOTAL [Cols. (1) to (10)] 895 Hrs. 30 Mins.

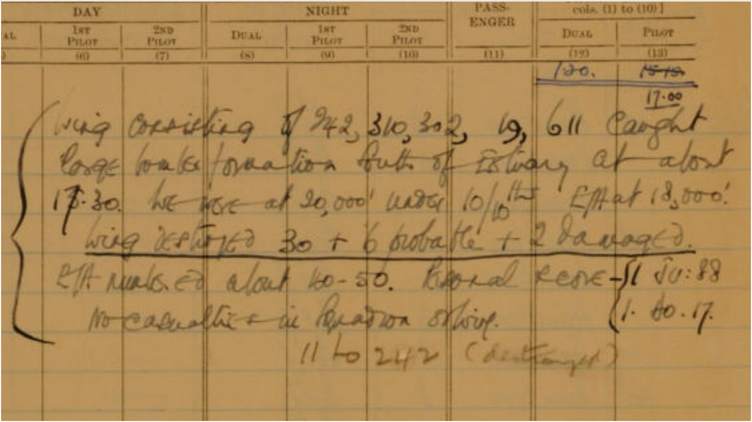


SINGLE-ENGINE AIRCRAFT · MULTI-ENGINE AIRCRAFT · DAY · NIGHT · DUAL (5) · 1ST PILOT (6) · 2ND PILOT (7) · DUAL (8)

18/9/40.

24/9/40. Sub: Lieut Cork awardc

YEAR 1940 MONTH	DATE	AIRCRAFT Type	No.
—	—	—	—
September	7th	Hurricane.	E
	8th	Hurricane.	S.
	—	Hurricane	D.
	9th	Hurricane	S.
	—	Hurricane.	S.
*	—	Hurricane.	S
	—	Hurricane	S.
	10th	Hurricane	X
	12th	Hurricane.	D.
	13th	Hurricane.	D.
	14th	Hurricane	D.
	—	Hurricane	D.
	—	Hurricane.	D.
*	15th	Hurricane	D.
	—	Hurricane	D.
	—	Hurricane.	D.
	16th	Hurricane.	D.
	—	Hurricane	D.
	17th	Hurricane	D.
	—	Hurricane.	D.
	—	Hurricane	D.
	18th	Hurricane.	D.

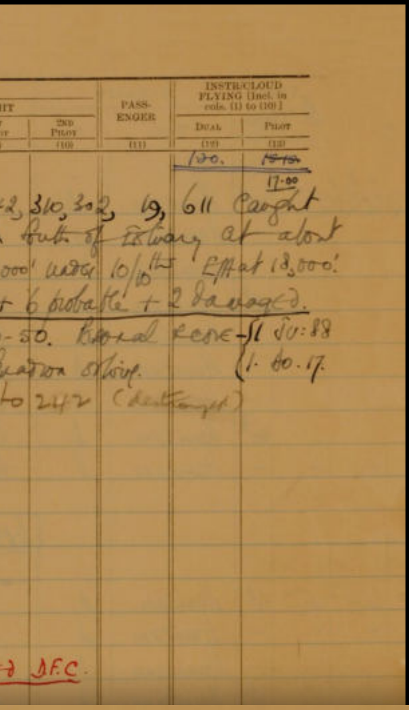


DAY 1ST PILOT (6)	2ND PILOT (7)	NIGHT DUAL (8)	1ST PILOT (9)	2ND PILOT (10)	PASSENGER (11)	cols. (1) to (10)] DUAL (12)	PILOT (13)
						1·20.	~~15·15~~
							17·00

Wing consisting of 242, 310, 302, 19, 611 caught large bomber formation south of Estuary at about 17.30. We were at 20,000' under 10/10ths. E/A at 18,000'. Wing destroyed 30 + 6 probable + 2 damaged. E/A numbered about 40-50. Personal score — 1 Ju: 88, 1. Do. 17. No casualties in Squadron or Wing. 11 to 242 (destroyed)

18 SEPTEMBER 1940

Formation south of the Estuary at about 17.30. We were at 20,000! ... No casualties in Squadron.



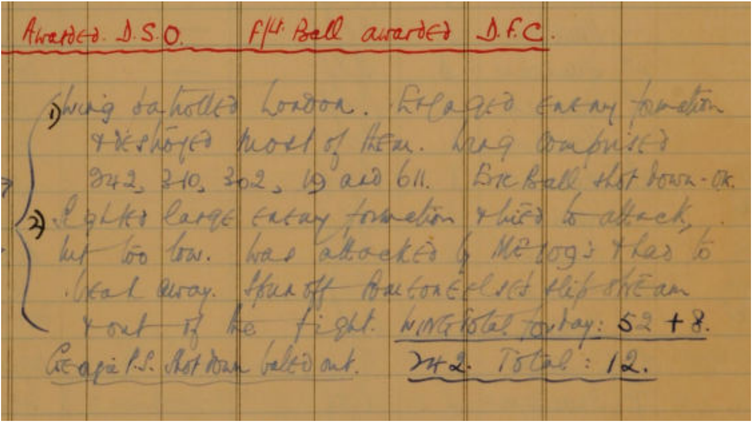
Pass-enger (11)	Instr/Cloud Flying [Incl. in cols. (1) to (10)] Dual (12)	Pilot (13)
	1.30.	~~15.15~~ 17.00

…2, 310, 302, 19, 611 Caught … South of Estuary at about …000' under 10/10ths Effort 18,000'. … 6 probable + 2 damaged. …-50. Record score – {1 Do: 88 {1. Do. 17. …Squadron … …to 242 (…)

…d D.F.C.

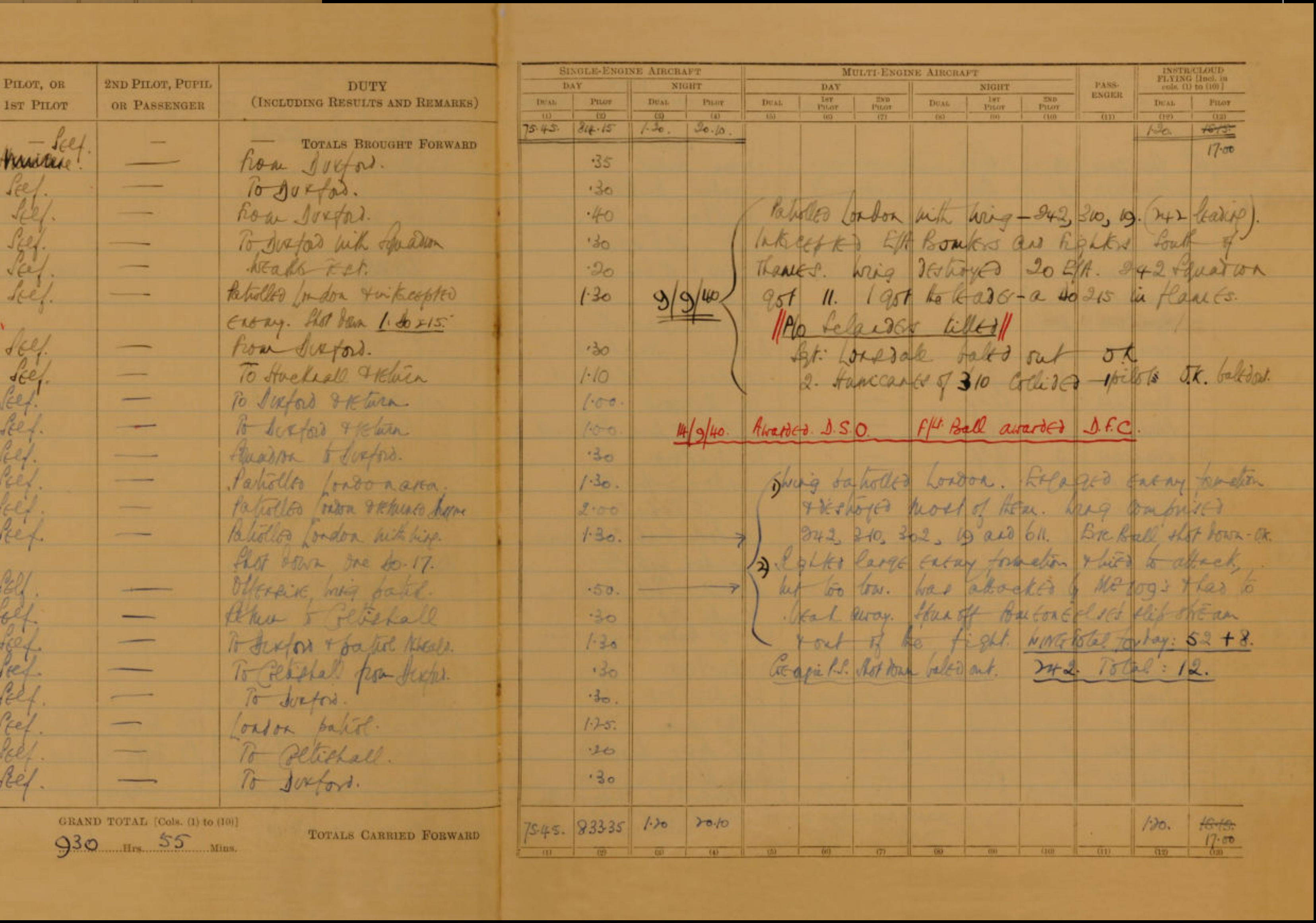
14 SEPTEMBER 1940

Sighted large enemy formation & tried to attack, but too low. Was attacked by ME 109s & had to break away. Spun off [pilot's name]'s slipstream & out of the fight.



Awarded D.S.O. F/Lt. Ball awarded D.F.C.

1) Wing patrolled London. Engaged enemy formation & destroyed most of them. Wing comprised 242, 310, 302, 19 and 611. Eric Ball shot down – O.K.
2) Sighted large enemy formation & tried to attack, but too low. Was attacked by ME 109s & had to break away. Spun off [illegible] slipstream & out of the fight. Wing total today: 52 + 8.
[illegible] shot down baled out. 242 Total: 12.



Pilot, or 1st Pilot	2nd Pilot, Pupil or Passenger	Duty (Including Results and Remarks)	Single-Engine Aircraft Day Dual (1)	Single-Engine Aircraft Day Pilot (2)	Single-Engine Aircraft Night Dual (3)	Single-Engine Aircraft Night Pilot (4)	Instr/Cloud Flying Dual (12)	Instr/Cloud Flying Pilot (13)
— Self.	—	— Totals Brought Forward	75.45.	814.15	1.30.	20.10.	1.30.	~~15.15~~ 17.00
Hurricane!	—	From Duxford.		.35				
Self.	—	To Duxford.		.30				
Self.	—	From Duxford.		.40				
Self.	—	To Duxford with squadron		.30				
Self.	—	heads set.		.20				
Self.	—	Patrolled London & intercepted		1.30				
		enemy. Shot down 1 Do 215.						
Self.	—	From Duxford.		.30				
Self.	—	To Hucknall & return		1.10				
Self.	—	To Duxford & return		1.00.				
Self.	—	To Duxford & return		1.00				
Self.	—	Squadron to Duxford.		.30				
Self.	—	Patrolled London area.		1.30.				
Self.	—	Patrolled London & returned home		2.00				
Self.	—	Patrolled London with wing.		1.30.				
		Shot down one Do 17.						
Self.	—	Otherwise, wing patrol.		.50.				
Self.	—	Return to Coltishall		.30				
Self.	—	To Duxford & patrol [illegible].		1.30				
Self.	—	To Coltishall from Duxford.		.30				
Self.	—	To Duxford.		.30.				
Self.	—	London patrol.		1.25.				
Self.	—	To Coltishall.		.20				
Self.	—	To Duxford.		.30				
Grand Total [Cols. (1) to (10)] 930 Hrs. 55 Mins.		Totals Carried Forward	75.45.	833.35	1.30	20.10	1.30.	~~15.15~~ 17.00

9/9/40 Patrolled London with Wing – 242, 310, 19. (242 leading). Intercepted E/A bombers and fighters South of Thames. Wing destroyed 20 E/A. 242 Squadron got 11. I got the leader – a Do 215 in flames.
‖P/O Sclanders killed‖
Sgt. Lonsdale baled out O.K.
2. Hurricanes of 310 collided – pilots O.K. baled out.

14/9/40. Awarded D.S.O. F/Lt. Ball awarded D.F.C.

1) Wing patrolled London. Engaged enemy formation & destroyed most of them. Wing comprised 242, 310, 302, 19 and 611. Eric Ball shot down – O.K.
2) Sighted large enemy formation & tried to attack, but too low. Was attacked by ME 109s & had to break away. Spun off [illegible] slipstream & out of the fight. Wing total today: 52 + 8.
[illegible] shot down baled out. 242 Total: 12.

AIRCRAFT CAMP

The crew of a Hurricane aircraft are pictured here camping out on the airfield, as they await the call to scramble. This picture was taken in April, 1940.

SEALION POSTPONED

For Hitler and the German High Command, the whole purpose of the Battle of Britain had been to destroy the RAF as an effective defensive force in order to open the way for a rapid invasion of southern England in September. Operation Sealion envisaged landing up to nine divisions of the 9th and 16th German armies on a front from Deal in Kent to Rottingdean in Sussex. Rapid reinforcements, supported by air forces, would then aim first for a line from Gravesend to Portsmouth, then a second line from the Essex coast to the Severn Estuary, including the capture of London. The invasion date had been fixed provisionally for 15 September.

On 30 August, the date was switched to 20 September to allow the navy to complete its build-up. Barges, motor boats, tugs and large transport craft were assembled in the ports along the coastline facing southern England, a total of 3,494 vessels of all kinds. These were subjected to persistent though not heavy attacks by Bomber Command from July onwards, but fewer than 10 per cent of the boats were destroyed or damaged. The issues that mattered for German planners were the weather, which was expected to deteriorate steadily over the autumn weeks, and the evident failure to eliminate the RAF, either Fighter or Bomber Command. The Royal Navy also constituted a serious obstacle to any possible landing. In conferences in the first two weeks of September, the navy commander-in-chief, Grand Admiral Raeder, told Hitler that the conditions for a successful landing had not been met and recommended an indirect strategy of blockade. On 14 September, Hitler assembled his commanders for a final conference on "the England problem". He told them that preparations were complete but the risk from the air was still too great. He postponed a final decision until 17 September, by which time the air battles two days previously had demonstrated decisively that the German air force had failed to gain air superiority.

On 17 September Hitler decided to postpone Sealion indefinitely, though he did not rule out an operation in October. A directive two days later ordered preparations to be scaled down and barges and transports began to leave the Channel ports. On 12 October, Hitler announced that any landing in 1940 was ruled out but that the impression of possible invasion should be maintained so as to put continuous pressure on British resolve. German air forces were now to bear the responsibility for trying to force Britain out of the war by a sustained campaign of night-bombing against major ports and cities. On the British side, the German decision was difficult to interpret. Photo reconnaissance showed that the number of barges clearly visible had declined from 1,004 on 18 September to only 448 in the last week of October, but many more could be seen waiting on canals not much further inland. The state of readiness in Britain was only relaxed towards the end of October, but there remained strong fears that the German threat would be renewed in the spring and British planning had to be based on that possibility.

In fact Hitler had now turned to face a different enemy. Already in July, he had hinted at a possible

ABOVE: The German foreign minister Joachim von Ribbentrop greets his Soviet counterpart, Vyacheslav Molotov, as he arrives at a station in Berlin on 12 November 1940. Discussions proved fruitless and Hitler decided to attack the Soviet Union the following spring.

CODEWORD CROMWELL

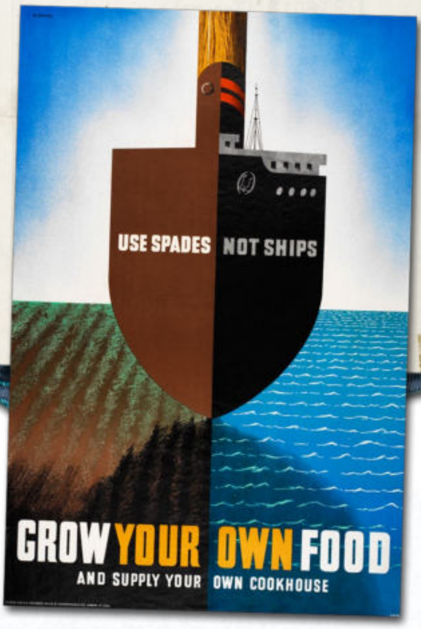
In the summer of 1940, British forces prepared for possible invasion. The preparations included two signals to be sent out to forces in the event of a probable German landing. The first was for eight hours' notice, the second, activated by the codeword CROMWELL, was for immediate action. On 7 September, the information suggested an imminent invasion and in the evening of that day the signal CROMWELL was sent to all units in eastern and southern England. The RAF had a three-level warning with number one, "attack imminent", as the most severe. On 7 September, that warning was also sent out to all air squadrons. The warnings caused some panic and sightings were reported of German parachutists and German boats, but all proved groundless. Not until 25 October did the RAF release the signal to units that invasion was improbable, by which stage it was evident that German forces were not going to come that autumn.

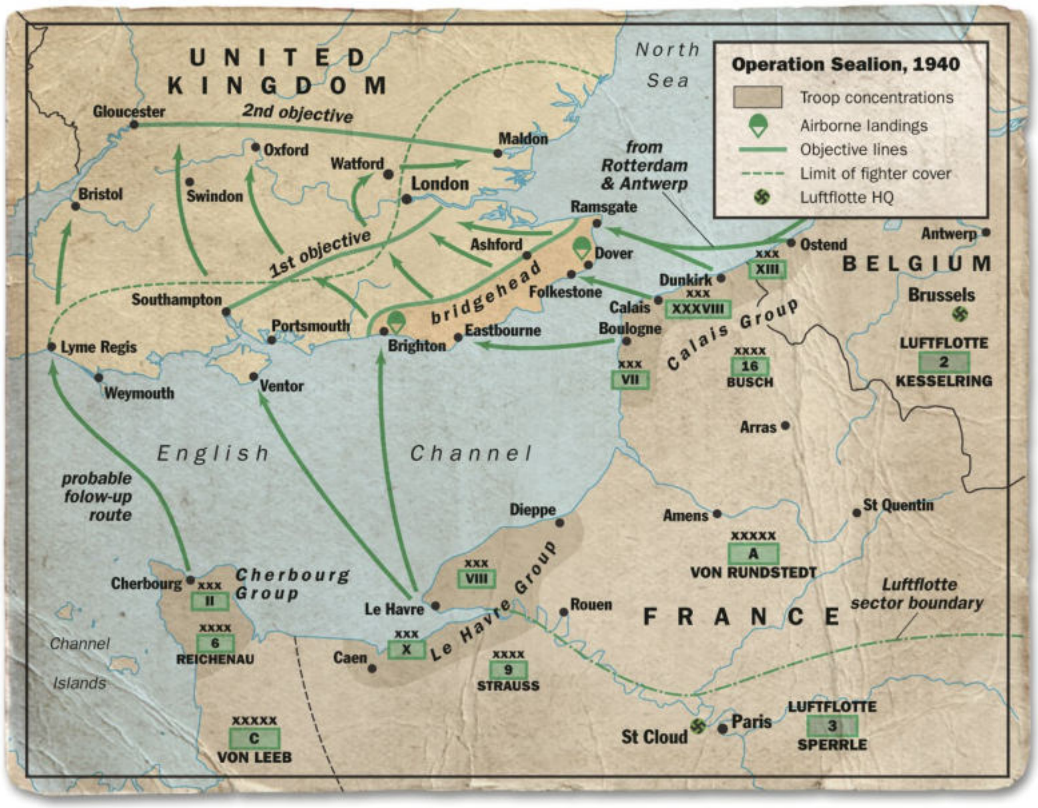
ABOVE: Members of the Home Guard training with a Lewis gun in 1940. German commanders had orders to treat them like partisans and shoot them.

BELOW: Two soldiers stand guard on a beach with a barbed wire barricade in southern England on 2 September 1940. Five days later the alert was given for imminent invasion.

THE GERMAN BLOCKADE

One of the central features of German strategy during 1940 was to find ways of blockading British trade and undermining British war-willingness and the British war economy. Throughout the Battle of Britain and beyond, German aircraft and submarines attacked British vessels around the coast, in port or in the western approaches to the British Isles. During 1940, over 1,000 ships were sunk, totalling four million tons, one-quarter of the British merchant fleet. By 1941, British imports were down to 38 per cent of the level of 1938. The food crisis was met by rationing and large scale propaganda for turning gardens and parks into allotments for growing food. By the end of the war, there were 1.7 million allotments, producing enough food to secure reasonable rations and to reduce food imports by half.


USE SPADES
NOT SHIPS
GROW YOUR OWN FOOD
AND SUPPLY YOUR OWN COOKHOUSE

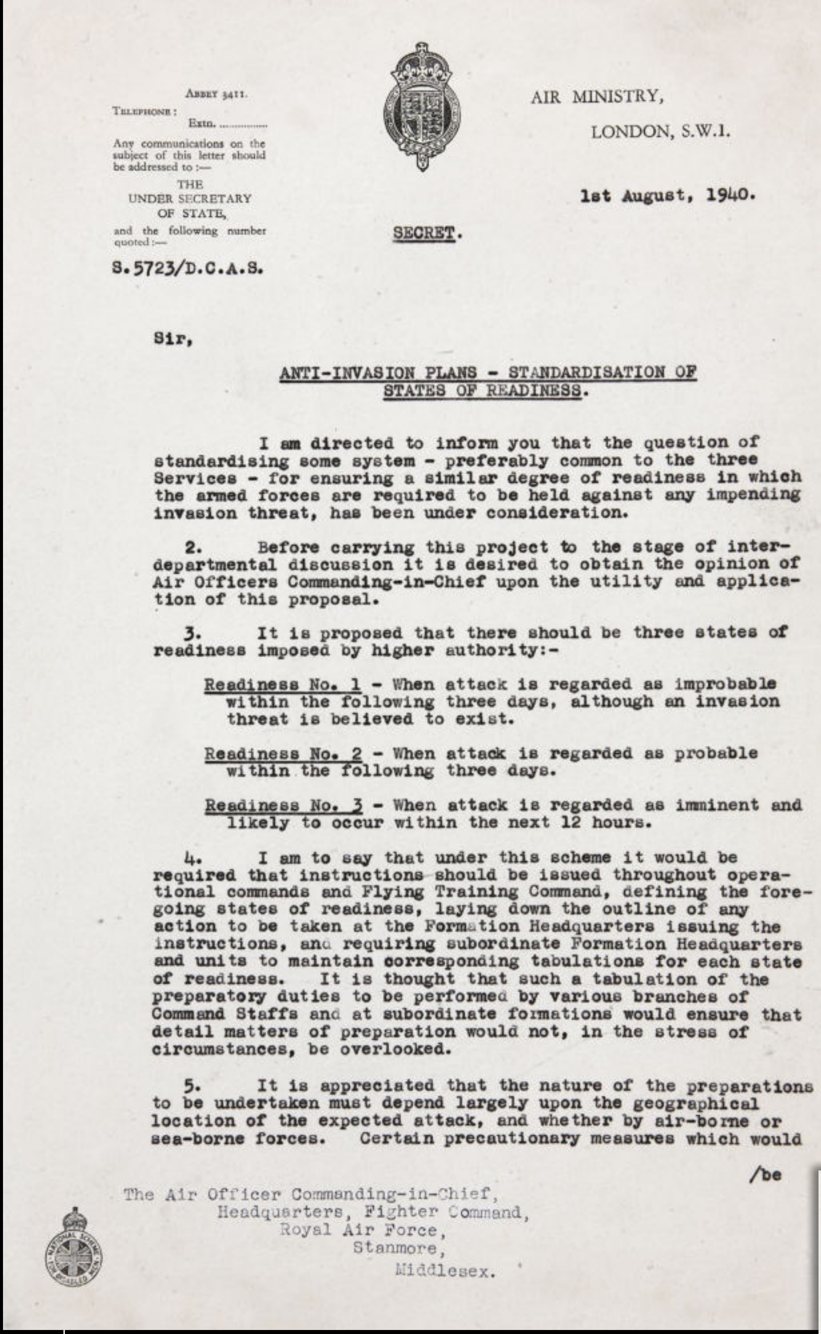

Operation Sealion, 1940
Troop concentrations
Airborne landings
Objective lines
Limit of fighter cover
Luftflotte HQ
UNITED KINGDOM
North Sea
2nd objective
1st objective
bridgehead
Gloucester
Oxford
Maldon
Watford
London
Bristol
Swindon
from Rotterdam & Antwerp
Ramsgate
Ashford
Dover
Folkestone
Southampton
Portsmouth
Eastbourne
Brighton
Lyme Regis
Weymouth
Ventor
English
Channel
probable folow-up route
Dieppe
Cherbourg
XXX II
Cherbourg Group
XXXX 6 REICHENAU
Le Havre
XXX VIII
Le Havre Group
Rouen
XXX X
Caen
XXXX 9 STRAUSS
Channel Islands
XXXXX C VON LEEB
Antwerp
Ostend
XXX XIII
BELGIUM
Brussels
Dunkirk
XXX XXXVIII
Calais
Boulogne
Calais Group
XXX VII
XXXX 16 BUSCH
LUFTFLOTTE 2 KESSELRING
Arras
Amens
St Quentin
XXXXX A VON RUNDSTEDT
Luftflotte sector boundary
FRANCE
St Cloud
Paris
LUFTFLOTTE 3 SPERRLE

swift blow against the Soviet Union in the early summer of 1941. During September, planning went ahead for the invasion, organized by General Friedrich Paulus. From 12–13 November 1940, the Soviet foreign minister, Vyacheslav Molotov, visited Berlin to try to negotiate new agreements over spheres of influence in Eastern Europe. The discussions, interrupted by an RAF raid which forced Molotov and von Ribbentrop to shelter in an underground bunker, showed Hitler that the Soviet appetite for further gains was growing and he finally approved preparations for an invasion. On 18 December, he signed Directive 21 "Operation Barbarossa" for an annihilating assault on the Soviet Union in May 1941. He planned to settle with Britain again after the defeat of the Red Army and the acquisition of vast Russian resources.

ABOVE: A map of the planned German assault on southern England in autumn 1940, to be mounted from three separate areas on the southern Channel coast. The operation was designed to secure a bridgehead in Kent and Sussex, then to seize London and finally to reach a line from the Bristol Channel to East Anglia. By this time it was hoped that the British government would sue for peace.

BELOW: Bombs explode during an attack by RAF Bomber Command on barges at Boulogne destined to take part in the German invasion. Almost 1,000 tons of bombs were dropped on the Channel ports in September 1940 though only around 10 per cent of German shipping was destroyed.

BELOW: German troops rehearsing the invasion of southern England in the late summer of 1940. In the background is a ship converted to a transport and landing role. German forces trained hard for the amphibious operation but there was little experience on which to draw.



ABBEY 3411.
TELEPHONE:
Extn. ....

Any communications on the subject of this letter should be addressed to:—

THE
UNDER SECRETARY
OF STATE,
and the following number quoted:—

S.5723/D.C.A.S.

AIR MINISTRY,
LONDON, S.W.1.

1st August, 1940.

SECRET.

Sir,

ANTI-INVASION PLANS - STANDARDISATION OF STATES OF READINESS.

I am directed to inform you that the question of standardising some system - preferably common to the three Services - for ensuring a similar degree of readiness in which the armed forces are required to be held against any impending invasion threat, has been under consideration.

2. Before carrying this project to the stage of inter-departmental discussion it is desired to obtain the opinion of Air Officers Commanding-in-Chief upon the utility and application of this proposal.

3. It is proposed that there should be three states of readiness imposed by higher authority:-

Readiness No. 1 - When attack is regarded as improbable within the following three days, although an invasion threat is believed to exist.

Readiness No. 2 - When attack is regarded as probable within the following three days.

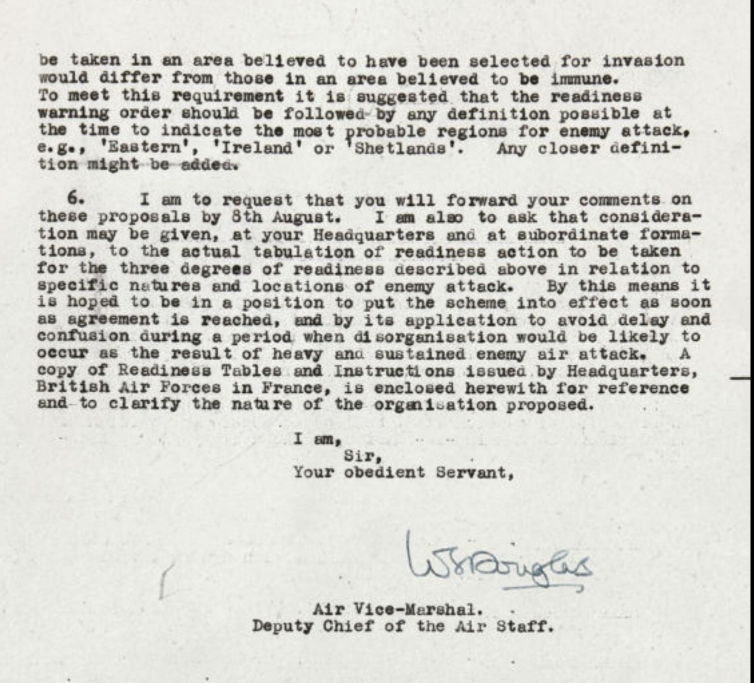
Readiness No. 3 - When attack is regarded as imminent and likely to occur within the next 12 hours.

4. I am to say that under this scheme it would be required that instructions should be issued throughout operational commands and Flying Training Command, defining the foregoing states of readiness, laying down the outline of any action to be taken at the Formation Headquarters issuing the instructions, and requiring subordinate Formation Headquarters and units to maintain corresponding tabulations for each state of readiness. It is thought that such a tabulation of the preparatory duties to be performed by various branches of Command Staffs and at subordinate formations would ensure that detail matters of preparation would not, in the stress of circumstances, be overlooked.

5. It is appreciated that the nature of the preparations to be undertaken must depend largely upon the geographical location of the expected attack, and whether by air-borne or sea-borne forces. Certain precautionary measures which would

/be

The Air Officer Commanding-in-Chief,
Headquarters, Fighter Command,
Royal Air Force,
Stanmore,
Middlesex.



be taken in an area believed to have been selected for invasion would differ from those in an area believed to be immune. To meet this requirement it is suggested that the readiness warning order should be followed by any definition possible at the time to indicate the most probable regions for enemy attack, e.g., 'Eastern', 'Ireland' or 'Shetlands'. Any closer definition might be added.

6. I am to request that you will forward your comments on these proposals by 8th August. I am also to ask that consideration may be given, at your Headquarters and at subordinate formations, to the actual tabulation of readiness action to be taken for the three degrees of readiness described above in relation to specific natures and locations of enemy attack. By this means it is hoped to be in a position to put the scheme into effect as soon as agreement is reached, and by its application to avoid delay and confusion during a period when disorganisation would be likely to occur as the result of heavy and sustained enemy air attack. A copy of Readiness Tables and Instructions issued by Headquarters, British Air Forces in France, is enclosed herewith for reference and to clarify the nature of the organisation proposed.

I am,
Sir,
Your obedient Servant,

W S Douglas

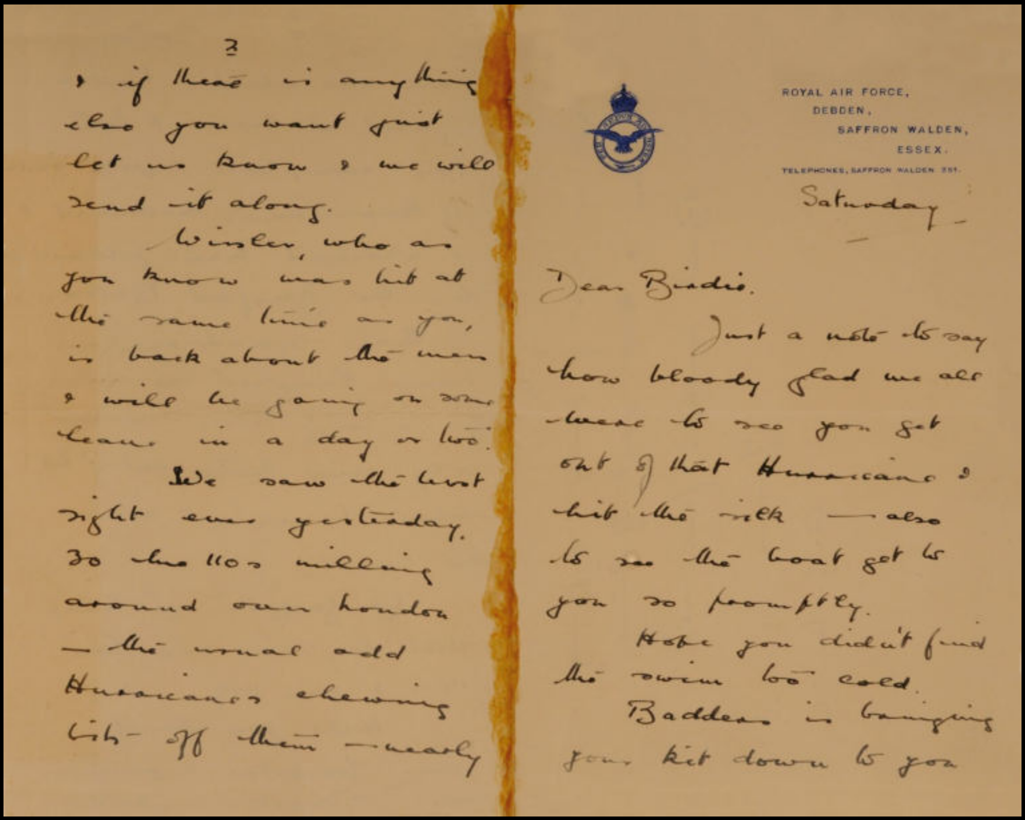
Air Vice-Marshal.
Deputy Chief of the Air Staff.

AIR MINISTRY LETTER

A letter dated 1 August from Sholto Douglas at the Air Ministry to Dowding describing the different states of alert in preparation for a German invasion. On 27 August the order of the alerts was reversed, causing confusion.

1 AUGUST 1940

It is appreciated that the nature of the preparations to be undertaken must depend largely upon the geographical location of the expected attack, and whether by air-borne or sea-borne forces.



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& if there is anything else you want just let us know & we will send it along.

Winsler, who as you know was hit at the same time as you, is back about the mess & will be going on some leave in a day or two.

We saw the best sight ever yesterday. 30 odd 110s milling around over London — the usual odd Hurricanes chewing bits off them — nearly

ROYAL AIR FORCE,
DEBDEN,
SAFFRON WALDEN,
ESSEX.
TELEPHONES, SAFFRON WALDEN 351.

Saturday —

Dear Birdie.

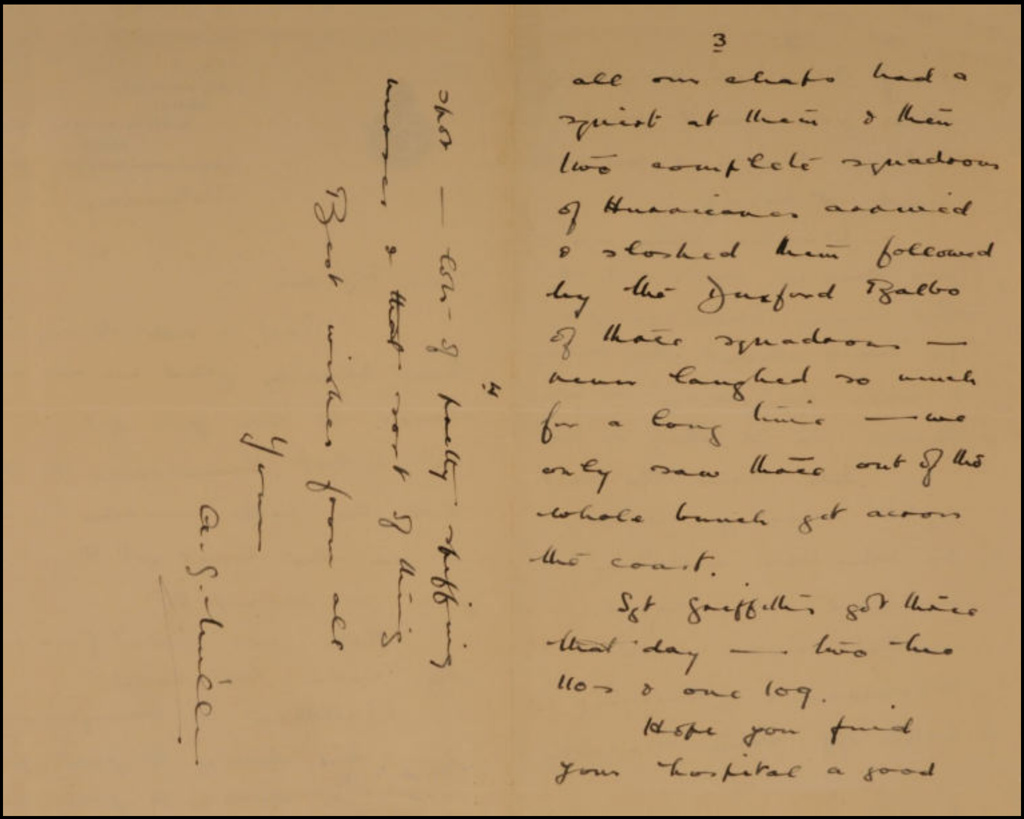
Just a note to say how bloody glad we all were to see you get out of that Hurricane & hit the silk — also to see the boat get to you so promptly.

Hope you didn't find the swim too cold.

Badden is bringing your kit down to you

BEST WISHES FROM ALL

Just a note to say how bloody glad we all were to see you get out of that Hurricane... Hope you didn't find the swim too cold.



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all our chaps had a squirt at them & then two complete squadrons of Hurricanes arrived & sloshed them followed by the Duxford Balbo of three squadrons — never laughed so much for a long time — we only saw three out of the whole bunch get across the coast.

Sgt Griffiths got three that day — two Me 110s & one 109.

Hope you find your hospital a good

4

spot — lots of pretty stuffing nurses & that sort of thing

Best wishes from all

Yours

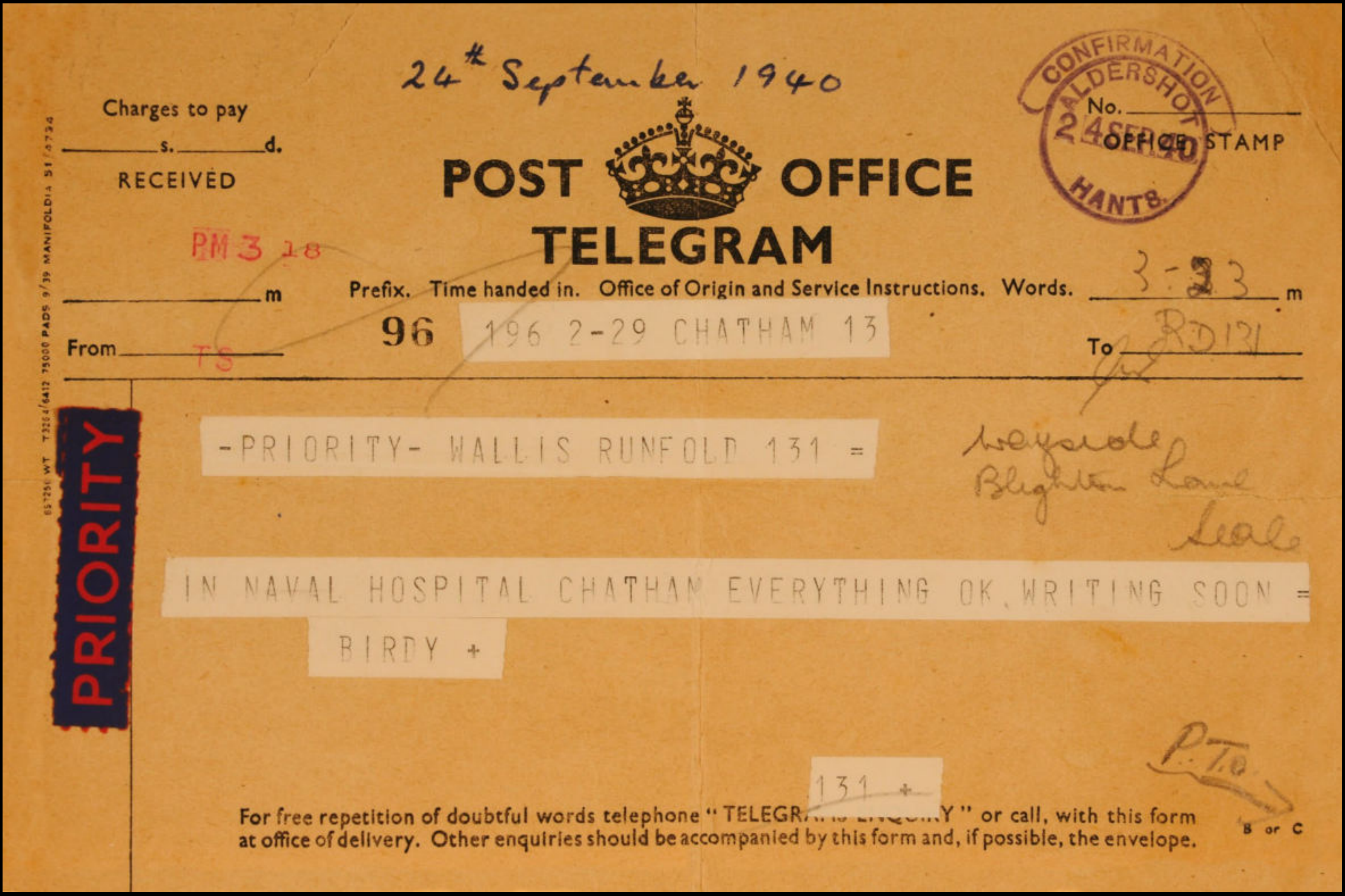
A. G.

DEAR BIRDIE LETTER

Above is a letter that was sent to Squadron Leader Harold Bird-Wilson while he was in hospital. It informs him of the air battle and sends warm wishes from the rest of the Squadron.

BIRD-WILSON TELEGRAM

Below is a telegram sent by Squadron Leader Harold Bird-Wilson to his family on 24 September 1940, reassuring them that he was alive. On the reverse is a 1999 archiving note, indicating that it was used for a BBC programme that year.



24th September 1940

Charges to pay
_____s._____d.
RECEIVED

PM 3 18

_____m

From TS

POST OFFICE
TELEGRAM

Prefix. Time handed in. Office of Origin and Service Instructions. Words.
96 196 2-29 CHATHAM 13

CONFIRMATION ALDERSHOT 24 SEP 40 HANTS.
No.
OFFICE STAMP

3-33 m

To RD131

PRIORITY

-PRIORITY- WALLIS RUNFOLD 131 =

Weyside
Blighton Lane
Seale

IN NAVAL HOSPITAL CHATHAM EVERYTHING OK. WRITING SOON =
BIRDY +

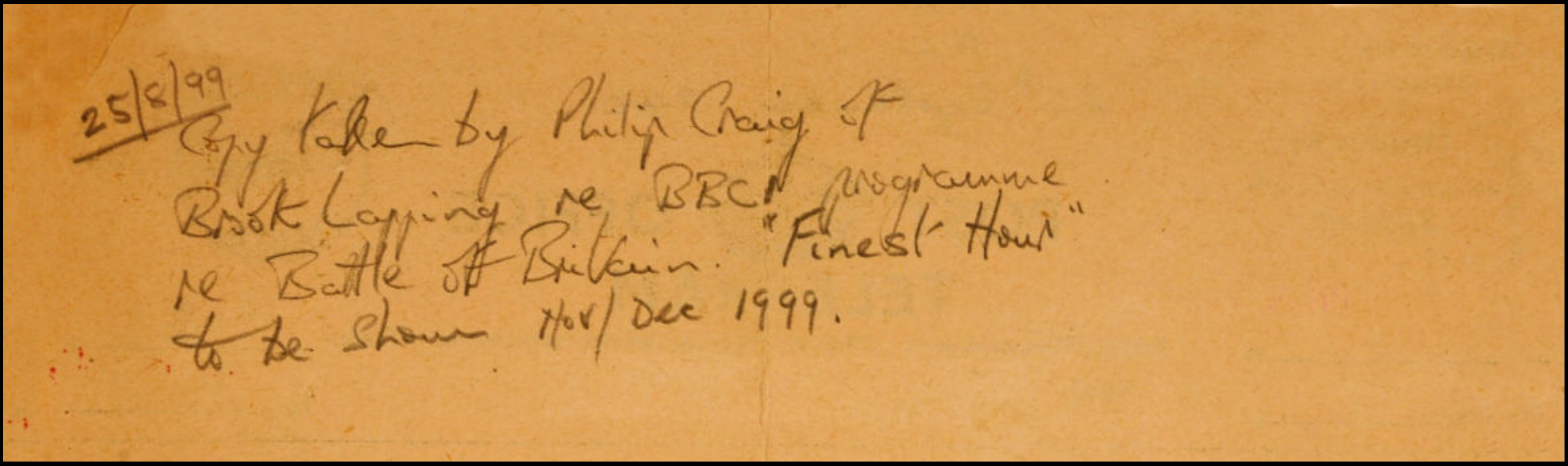
P.T.O.

131 +

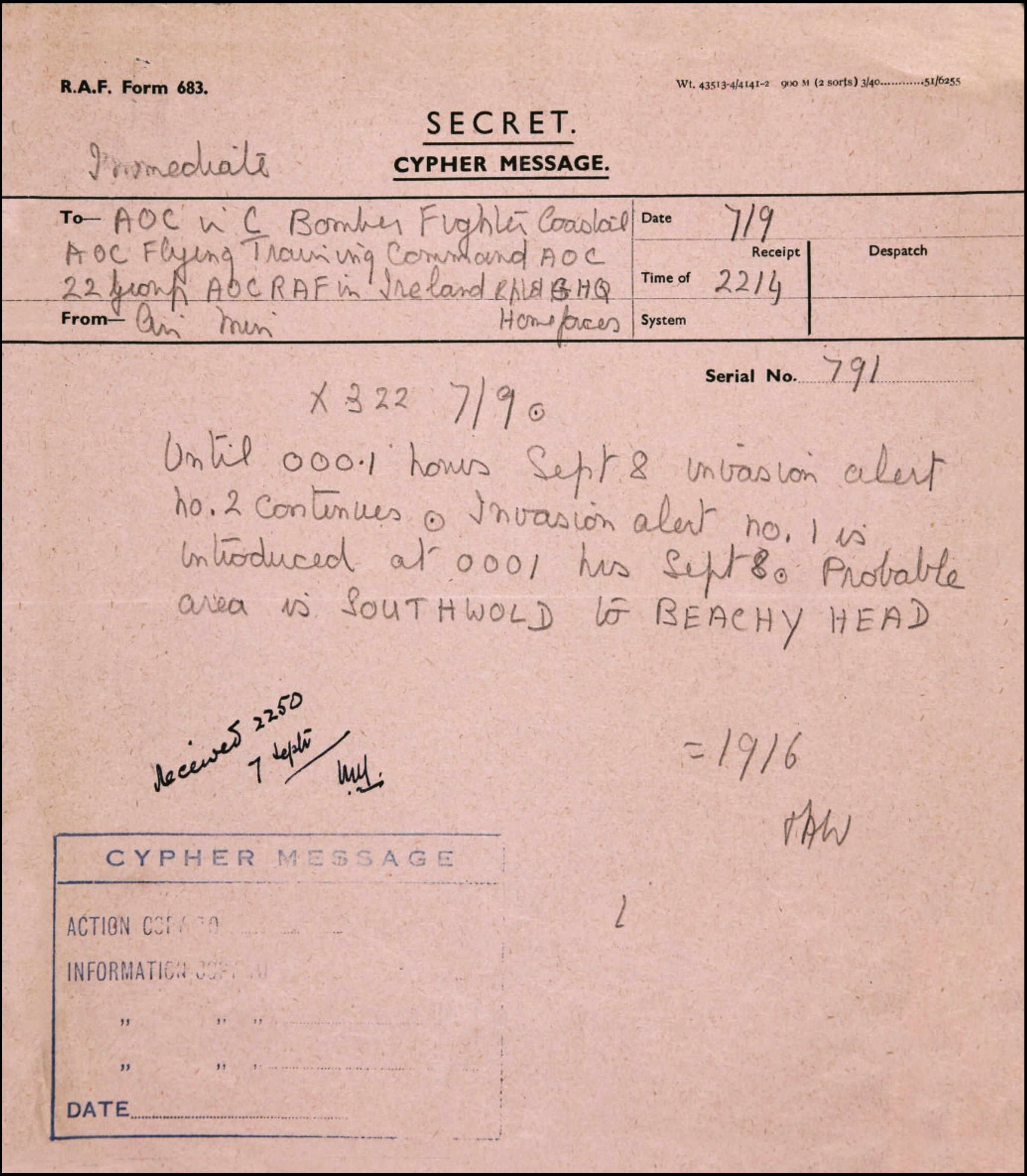
For free repetition of doubtful words telephone "TELEGR[illegible]Y" or call, with this form at office of delivery. Other enquiries should be accompanied by this form and, if possible, the envelope.

B or C

657250 WT T3264/6412 75000 PADS 9/39 MANIFOLDIA 51/6734



25/8/99
Copy taken by Philip Craig of
Brook Lapping re BBC programme
re Battle of Britain. "Finest Hour"
to be shown Nov/Dec 1999.



R.A.F. Form 683.

Wt. 43513-4/4141-2 900 M (2 sorts) 3/40............51/6255

SECRET.

CYPHER MESSAGE.

Immediate

To— AOC in C Bomber Fighter Coastal AOC Flying Training Command AOC 22 group AOC RAF in Ireland RAF & GHQ	Date 7/9		
		Receipt	Despatch
	Time of	2214	
From— Air Min Home forces	System		

Serial No. 791

X 322 7/9 ⊙

Until 0001 hours Sept 8 invasion alert no. 2 continues ⊙ Invasion alert no. 1 is introduced at 0001 hrs Sept 8 ⊙ Probable area is SOUTHWOLD to BEACHY HEAD

Received 2250 7 Sept

= 1916

CYPHER MESSAGE

ACTION COPY TO ....

INFORMATION COPY TO

" " " ....

" " " ....

DATE............

CYPHER MESSAGE

Above is a cypher message marked 'Secret' and dated from 7 September. The message warns of an "invasion imminent" for the following day, 8 September. Cyphers were vital to keeping intelligence safe during the war.

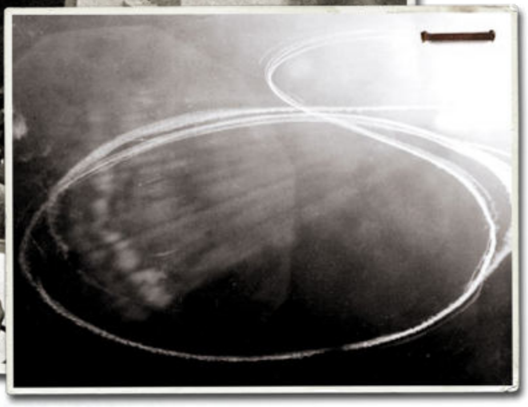
END OF THE BATTLE

1-31 OCTOBER

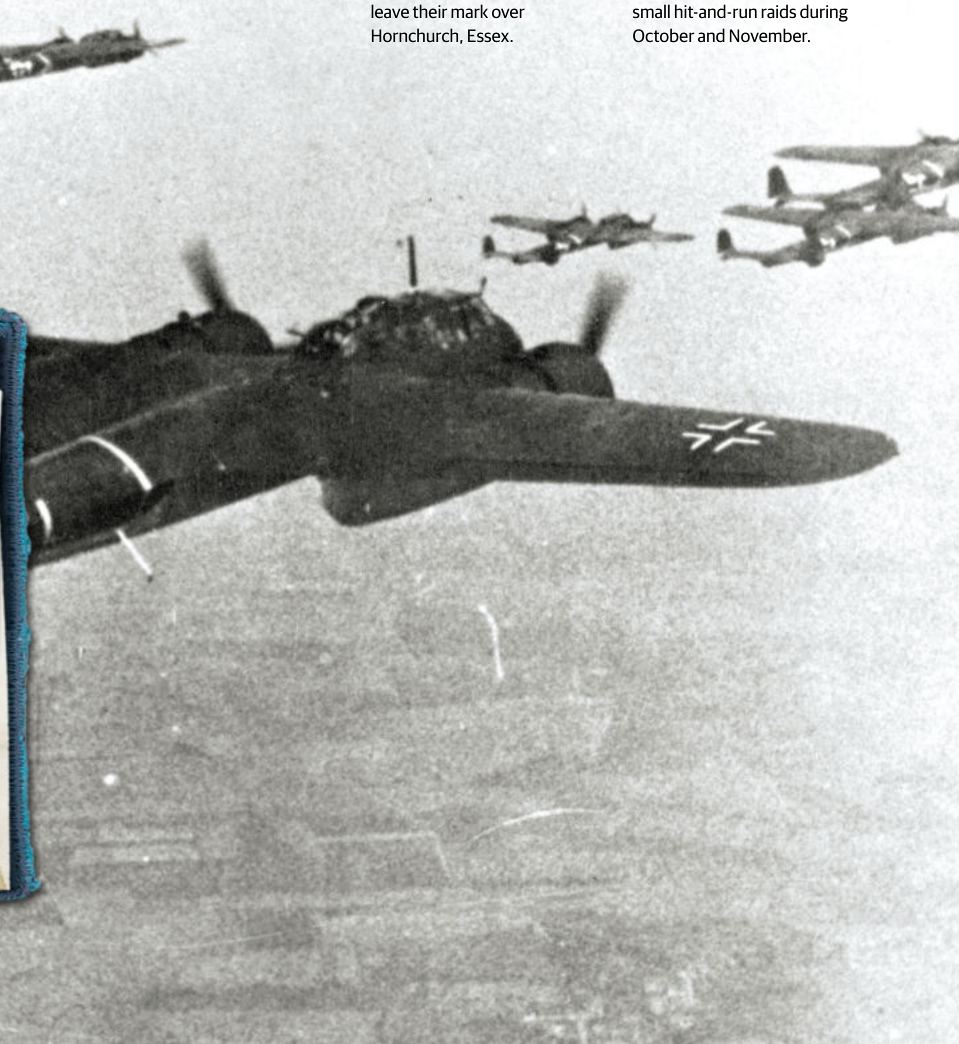
The German change to night bombing in October 1940 transformed the nature of the air battle as Fighter Command had to switch some of its effort to contesting the new campaign. By 3 November, there were 11 night-fighter squadrons and one night-fighter flight available, composed mainly of Blenheim, Beaufighter and Defiant aircraft, but with 3.5 Hurricane squadrons as well. The night fighters could achieve little without effective radar equipment and interception of enemy aircraft was largely accidental. It was the relative failure of the night-fighter campaign that contributed to the decision to remove Dowding in November. During October 1940, the German air force lost a further 365 aircraft, but more than half the losses sustained by German bombers from October onwards were the result of accidents caused by poor weather, ice and the difficulties of night-time navigation.

The day battle continued at a reduced level of intensity and with changed tactics. German air fleets sent over a large number of smaller raids by day using aircraft converted to a fighter-bomber role, usually protected by an extensive fighter screen. The purpose of these small hit-and-run attacks was to keep up pressure on the British civilian population round the clock, and to lure Fighter Command into fighter-to-fighter contests in which it was hoped that a high rate of attrition could be exacted from a force still thought to be close to extinction. The fighter-bomber attacks did not achieve a great deal, but RAF pilots

ABOVE: A crowd watches a newsreel on the RAF carried by a mobile cinema in October 1940. The films were designed to help raise money for the air effort, and thousands of pounds were given to help communities buy and donate their own Spitfire.



ABOVE: As the days grew colder in the late autumn, aircraft left spectacular vapour trails in the sky. Here the Spitfires of 41 Squadron leave their mark over Hornchurch, Essex.



BELOW: German Dornier Do17 bombers over southern England during the Battle of Britain. These and other bomber aircraft engaged in small hit-and-run raids during October and November.

AIR CHIEF MARSHAL SHOLTO DOUGLAS (1893–1969)

Dowding's successor as commander-in-chief of Fighter Command was Sholto Douglas, a career airman with a reputation for speaking his mind. He joined the Royal Flying Corps in 1914 and had a distinguished career as commander of 84 Squadron. He worked briefly as a commercial pilot before rejoining the RAF in 1920. In 1938, he became assistant chief of staff and in November 1940 succeeded Dowding as head of Fighter Command. In 1942 he was sent to be RAF Commander-in-Chief Middle East and in 1944 took charge of Coastal Command. After the war, he became military governor of the British zone of occupation in Germany from 1946–47. He retired in 1948 and became chairman of British European Airways from 1949 to 1964.

found themselves at a disadvantage against large groups of high-flying German fighters, which had better facilities and more effective engines for combat over 6,000 metres (20,000 feet). Both forces by this stage were strained by the weeks of intensive combat, but many pilots now had substantial combat experience and the dogfights in October and November 1940 pitted rival aces against each other.

To cope with the change in the pattern of German attack, Park ordered a new tactical approach. Standing patrols of high-flying Spitfires were sent up to give advance warning of approaching German fighters. Once the enemy had been identified, other squadrons patrolling at lower altitudes could be brought swiftly to the height necessary to engage the intruders. This did not solve the problem of the technical superiority of the Messerschmitt Me 109 at altitude, and 165 Spitfires and Hurricanes were shot down during October. Many of the contests were a result of Fighter Command rising to the German challenge. In reality, the fighter attacks represented little real risk to the British war effort and might have been absorbed at a much lower level of effort than Fighter Command eventually mounted. During October, 253 raids were mounted and in November a further 235. This was a heavy burden for both tired forces to sustain and by late November the campaign petered out. Smaller German raids persisted over the following three years of war until the arrival of the vengeance weapons – the V1 pilotless bomb and the V2 rocket – in the summer and autumn of 1944.

The real crisis confronted by Fighter Command in the autumn of 1940 was not the daylight threat but the failure to stem the tide of German night bombing. Despite high levels of attrition exacted from the German air forces from August onwards, it was difficult to prevent much of the bombing from taking place. It was this that contributed to the growing unease felt in the Air Ministry and in political circles about whether or not Dowding was adequate to the job of defending Britain. Though admired by Churchill, Dowding could do little about the whispering campaign. On 13 November, he was informed that he had been chosen to head a top-level mission to the United States; four days later he was told to give up his command immediately. It was found that his designated successor, Sholto Douglas, could not take over until 25 November so for another week Dowding agreed to stay in command. He sent a farewell message addressed to his "Fighter Boys" in which he repeated Churchill's stirring phrase about the few and the many as the only fitting tribute.

MAJOR HELMUT WICK (1915–1940)

One of the leading German air aces, Helmut Wick joined the German air force in 1935. He was rapidly promoted and in 1939 served in the squadron commanded by Werner Mölders. On the outbreak of war, he was flying with the "Richthofen" fighter wing and shot down his first aircraft on 22 November 1939. He enjoyed continued success, and was made a captain in September 1940 and commander of a fighter group. In October, he was made the youngest major in the air force and took over full command of the "Richthofen" unit. On the morning of 28 November, Wick made his 56th kill, making him the highest-scoring German ace, but just a few minutes later he was shot down by a Spitfire close to the Isle of Wight. Neither his aircraft nor his body were subsequently found.

RIGHT: A crashed Italian Fiat CR.42 fighter in Norfolk. At Mussolini's instigation a small number of Italian units, with a total of 170 aircraft, were based in Belgium for attacks on Britain later in the autumn. The biplanes were obsolete by the standard of the day.

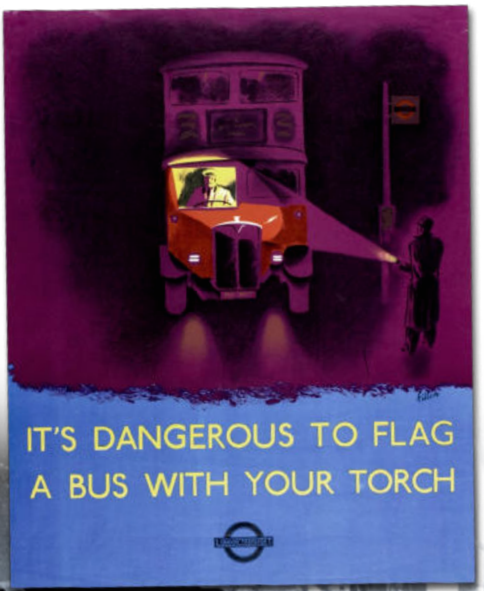
BELOW: The altar of St Paul's Cathedral surrounded by debris from the roof after a bomb attack in October 1940. The survival of the cathedral later came to symbolize British defiance of Hitler.

BELOW: The wreckage of a Messerschmitt Me 109 after it had crashed into a haystack on a farm on the outskirts of London on 9 October 1940. The air battles that month took a high toll of both sides for little strategic advantage.

THE NIGHT BLITZ

SEPTEMBER 1940–MAY 1941

The decision by the German high command to embark on a strategy of independent bombing from September onwards rested on an act of faith that bombing might - as so many had predicted between the wars - force an enemy to surrender without a the need for a conventional ground invasion. It is not clear that Hitler had much confidence in the outcome and he insisted in September that the air force should not engage in terror attacks for their own sake. Most of the air force commanders accepted the view that bombing people achieved very little, except dead people, while focused attacks against ports, shipping, stocks and communications might actually disrupt the British war effort sufficiently to produce the secondary effect of demoralization.



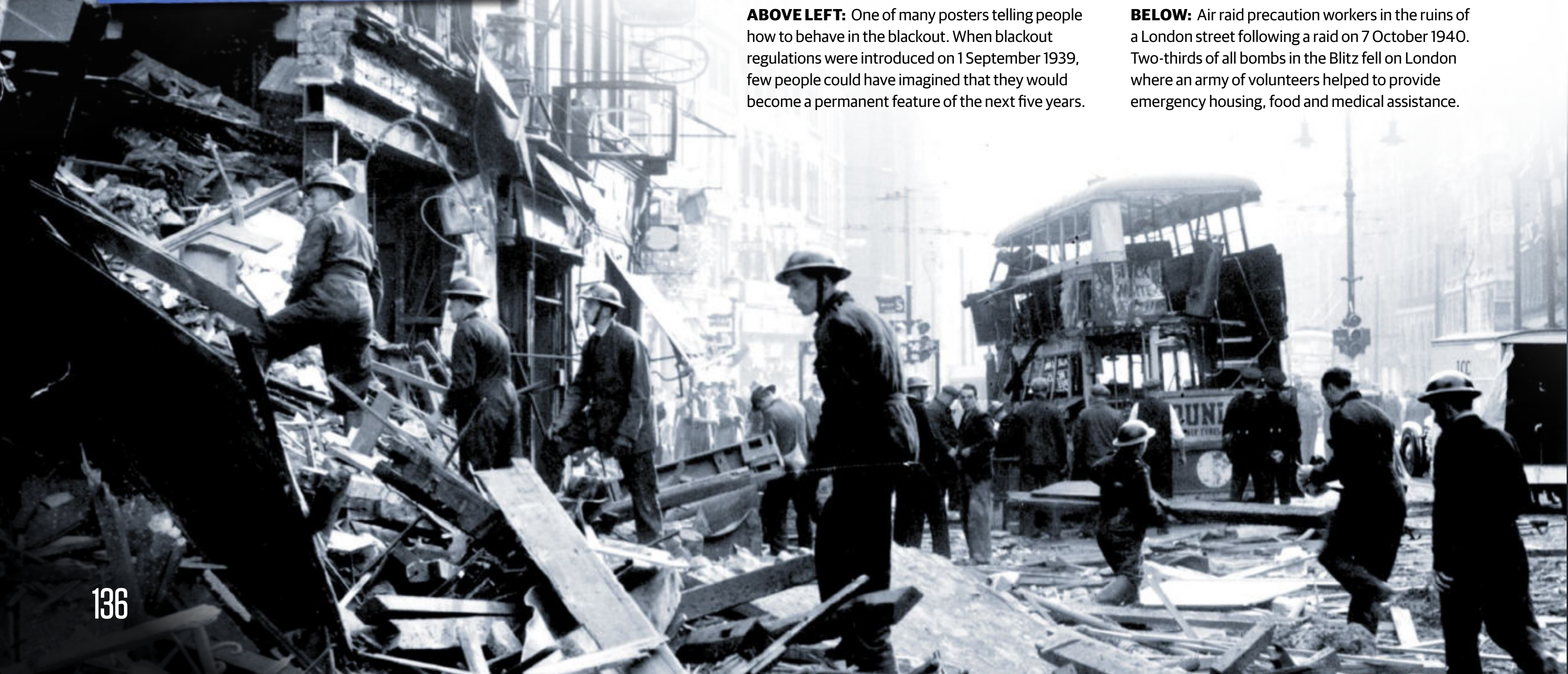
ABOVE LEFT: One of many posters telling people how to behave in the blackout. When blackout regulations were introduced on 1 September 1939, few people could have imagined that they would become a permanent feature of the next five years.

Nevertheless, there were politicians and commanders in Germany who hoped that the campaign would turn into a campaign against morale. The so-called "England Committee" in von Ribbentrop's Foreign Office favoured a short terror campaign in autumn 1940 to force Britain out of the war. Joseph Goebbels, the Minister for Propaganda, authorized German newspapers to publicize the bombing to help boost German opinion, but he also believed the exaggerated interwar predictions about how unendurable bombing was. In November, he wrote in his diary, "When will Churchill capitulate?" On 5 December, he recorded the extensive bombing of the port of Southampton: "the city is one single ruin … and so it must go on until England is on her knees, begging for peace". The German air force chief of staff, Hans Jeschonnek was also among those who imagined a terror campaign might produce real results, but he had to accept Hitler's restraining hand and the system of targeting continued to be based on economic and military priorities.

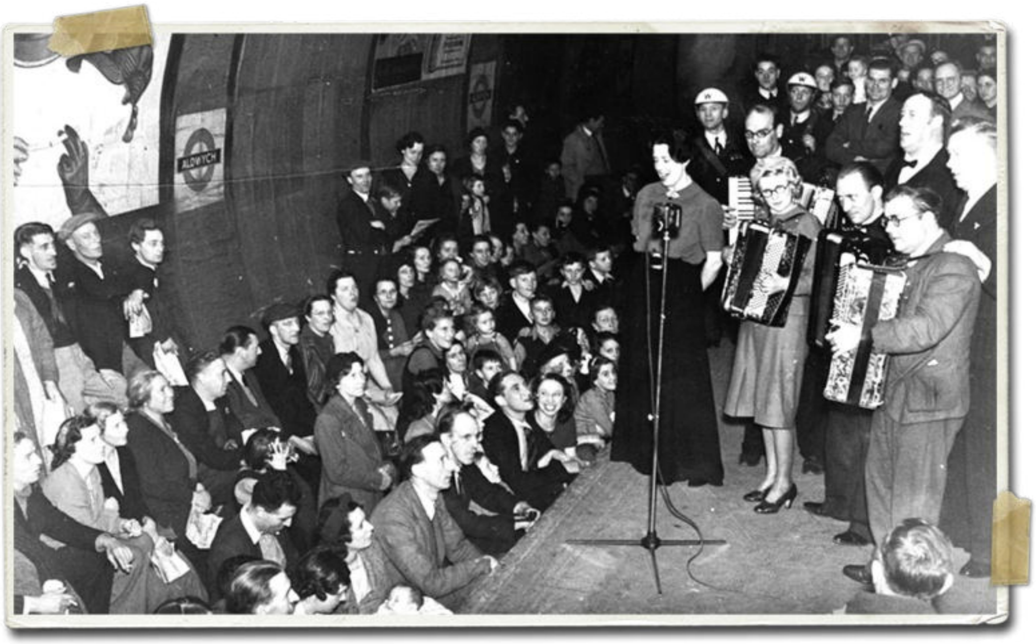
The night Blitz was concentrated on London, which experienced 57 consecutive days of bombing from 7 September to 2 November, and then intermittent and heavy bombing thereafter until 10 May. 18,000 tons of heavy explosive and incendiary bombs were dropped on London compared with 1,228 tons dropped on Plymouth, one of the most heavily destroyed targets after London. Heavy attacks were made on Belfast,

THE ANDERSON SHELTER

The sturdy metal garden shelter designed in 1938 by William Paterson and Oscar Kerrison was named after Sir John Anderson, the government minister responsible for preparing air-raid precautions. The shelter was made of 14 corrugated steel panels, with a curved roof section which was supposed to be covered by at least 0.4 metres (15 inches) of soil. They were issued free to householders with an income of less than £250 a year and there was also help with installation costs. Some 3.6 million shelters were distributed between February 1939 and the end of the war. They held up to six people and could contain bunks and other small items of furniture. The shelters were not able to withstand a direct hit and many became waterlogged. Those shelters deemed by the authorities to be unsuitable because of water either had a concrete floor laid down or were removed altogether, forcing the household to use local public shelters. At the end of the war, they were supposed to be returned to the authorities for scrap, but could be kept on payment of a small fee.



BELOW: Air raid precaution workers in the ruins of a London street following a raid on 7 October 1940. Two-thirds of all bombs in the Blitz fell on London where an army of volunteers helped to provide emergency housing, food and medical assistance.



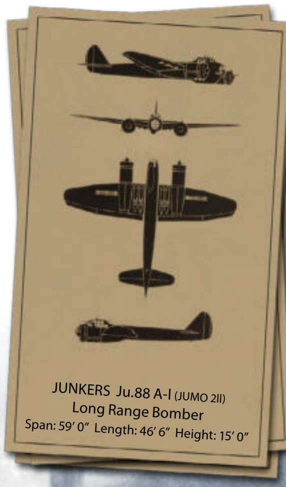
ABOVE: Londoners listening to a concert in the London Underground station at Aldwych where they had sought shelter on 21 October 1940. This station was among the first converted to provide shelter in September 1940. It was closed to trains and the tracks were covered in concrete.

Glasgow, Bristol, Birmingham, Liverpool, Manchester, Sheffield and Hull. The attack on Coventry on the night of 14–15 November 1940 attracted more attention than almost any other, partly because of the high number of deaths in a single raid, an estimated 554. In total, around 11,800 tons of bombs were dropped on targets outside London, and these accounted for around 50 per cent of the casualties. This was partly due to the fact that areas outside London were generally less well protected by anti-aircraft guns and had a lower level of civil defence preparation (and fewer shelters). The level of casualties was high in Britain because bomb attacks were directed against crowded working-class districts around port facilities, and because air-raid precautions were activated in an uneven pattern across the country. Over the course of the campaign, the German air force also tried to work out more destructive forms of attack using a higher ratio of incendiary bombs.

The reactions of the British public to the effects of bombing were mixed. There were mass flights from bombed towns into the countryside. Crime levels temporarily increased with new opportunities for looting. In London there was some political agitation in the East End about poor levels of protection and against the capital's Jewish population, which was accused of seeking shelter first. But in general, the reaction was one of resignation and determination. Millions found the courage and capacity to organize an army of volunteers for air-raid precautions, auxiliary fire services, first aid and the rehabilitation of bomb victims. These were civilians who saw themselves as soldiers of the home front and in 1942, to acknowledge their sacrifice, the Ministry of Information published the booklet "Frontline 1940–1941", designed to make it clear that total war as waged by the German armed forces compelled everyone on the home front to become a kind of civilian-soldier whether they liked it or not.

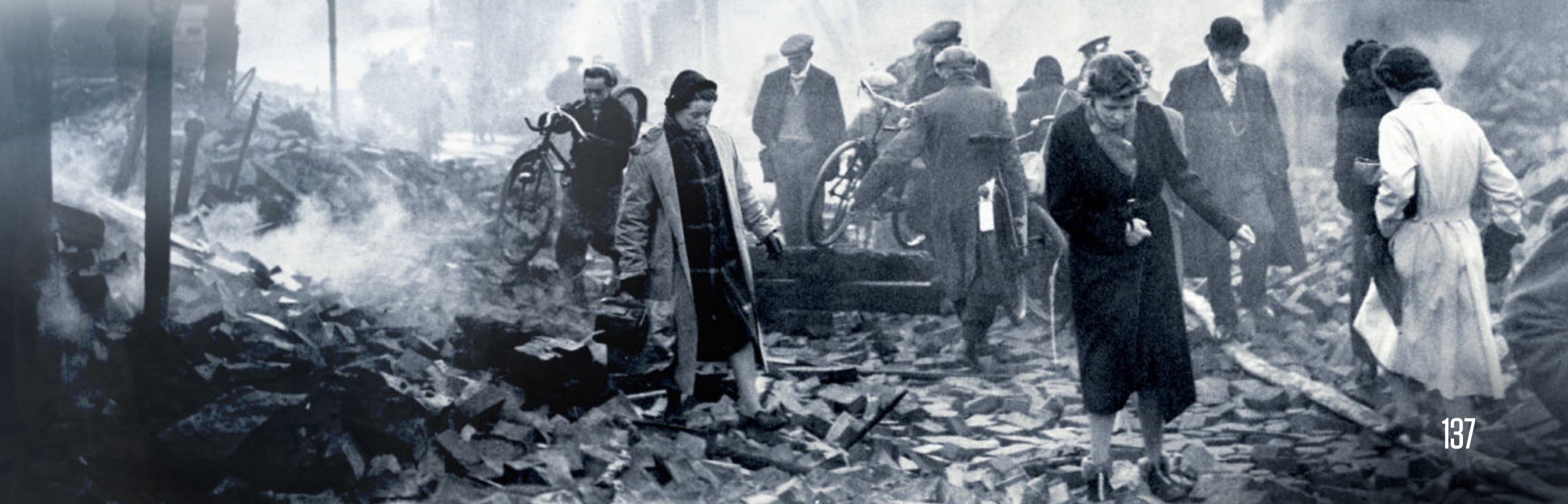
MASS OBSERVATION

Founded in 1937 by the anthropologist Tom Harrisson, the poet Charles Madge and the documentary film-maker Humphrey Jennings, Mass Observation (MO) was intended to record the feelings and outlook of ordinary British people. Thousands of volunteers were recruited who kept a record of conversations they heard and behaviour they observed. These records were used to help compile consolidated reports on aspects of everyday life. In September 1939, Harrisson took over the running of the whole MO organization. From September 1940 until the middle of 1941, a detailed record was kept of attitudes to the Blitz. Harrisson himself toured round the blitzed cities to form his own impressions. He eventually went on to write Living Through the Blitz, published shortly after his death in 1976. There was some official hostility to MO, but the organization shared some of its findings with the Ministry of Information as the war went on. Mass Observation left an invaluable record of the impact on ordinary people of a campaign of sustained bombing.


JUNKERS Ju.88 A-I (JUMO 2II)
Long Range Bomber
Span: 59′ 0″ Length: 46′ 6″ Height: 15′ 0″

RIGHT: A Junkers Ju 88 spotter card.

BELOW: Earl Street in Coventry following the disastrous raid of 14–15 November 1940. Much of the city centre, including the cathedral, was destroyed. The government chose to release the details to the press, the first time a city had actually been named in newspaper reports.



THE COSTS OF BATTLE

The costs of the Battle of Britain are difficult to assess with complete accuracy. The number of Fighter Command crew lost was once calculated at 449, but recent estimates put it at 544. Total German aircrew losses were much higher because the bombers typically carried a crew of four or five. In addition, 967 German aircrew prisoners were identified from the period between 1 July and 31 October 1940, while only 638 of the many maimed and burnt bodies that crashed on English territory could be positively identified. Hundreds of airmen on both sides were also injured, seriously wounded or simply exhausted by the long period of intense action.

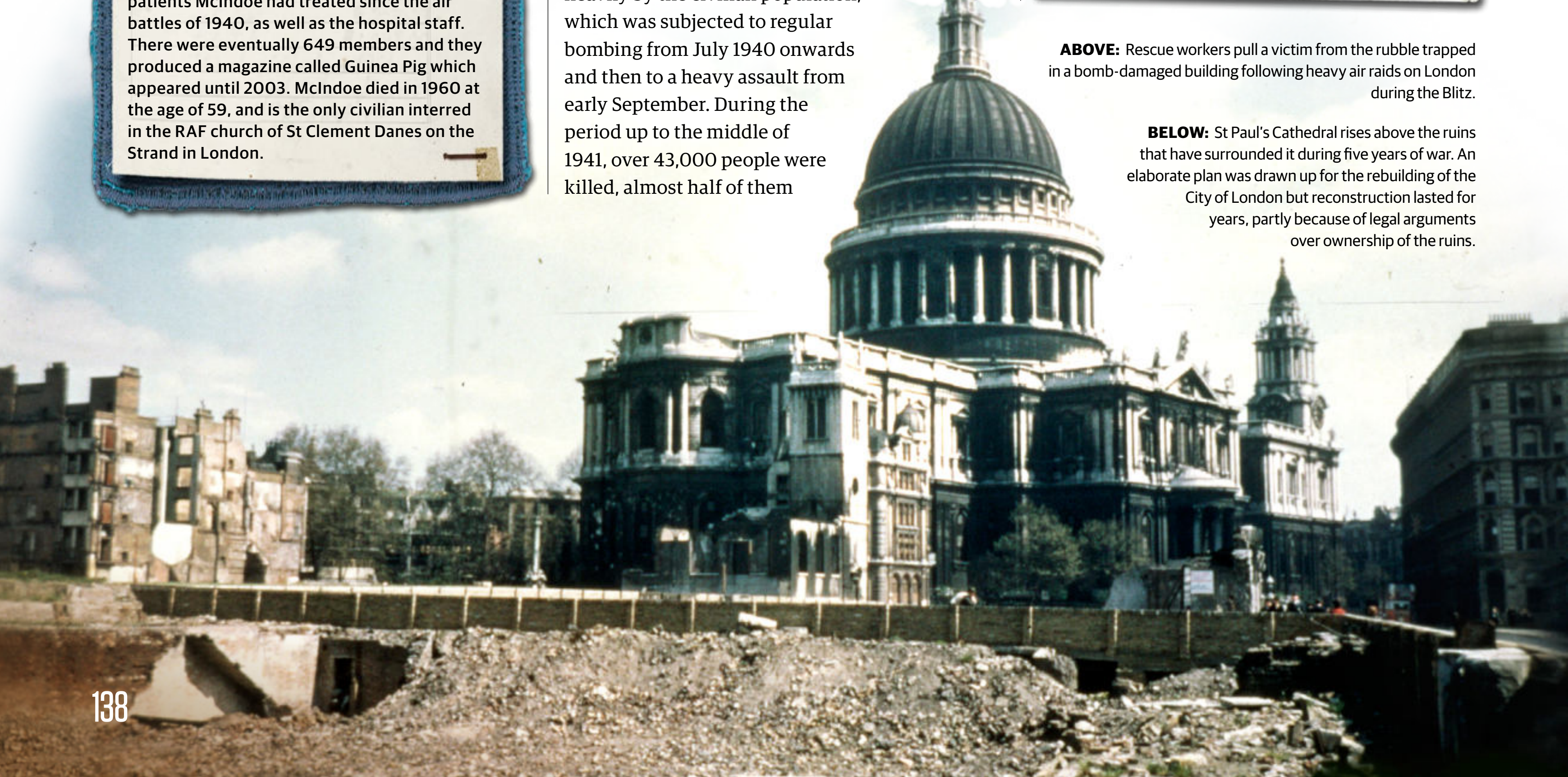
The number of dead was tiny in comparison with any ground action, or even the sinking of a major ship, and small in relation to the significance of the battle itself. In this sense Churchill's notion of "the Few" can be understood more readily. There were also casualties among ground crew and support staff, both male and female, and a considerable amount of serious damage to a handful of RAF stations. The losses of pilots and aircraft were generally made good, so that by the end of the battle Fighter Command had more aircraft and pilots on hand than at its start. By contrast, German losses caused a temporary decline in numbers so that by the end of the year the German fighter force was reduced by around 30 per cent and the bomber force by a quarter. The nature of air conflict, in which trained men and new aircraft can be prepared far from the battlefield and thrown into the conflict at any point, meant that although the RAF succeeded in preventing German air superiority over southern Britain, neither force could effectively be destroyed by the other.

The cost of the battle was borne more heavily by the civilian population, which was subjected to regular bombing from July 1940 onwards and then to a heavy assault from early September. During the period up to the middle of 1941, over 43,000 people were killed, almost half of them in London and the surrounding area. A larger number sustained major or minor injuries, but the exact figure remains somewhat uncertain. The high rate of expected psychiatric casualties from bombing did not materialize; the number of people admitted for treatment actually declined during the period of the bombing. In addition to the deaths and injuries, over 1 million housing units were destroyed or seriously damaged. This required evacuation to safer areas or the billeting of bombed-out families on households where there had not been damage. Schools were destroyed and many young Londoners missed

THE GUINEA PIG CLUB

The Guinea Pig Club was founded by the patients of the remarkable New Zealand plastic surgeon Archibald McIndoe. Its members were aircrew who had required extensive surgery as a result of severe burns. McIndoe set up a unit for plastic and jaw surgery at the Queen Victoria Hospital in East Grinstead, Surrey in 1939. He believed that patients needed general care as well as surgery, and the club ensured that those who had gone through a difficult hospitalization would be able to share their experience with others. The Guinea Pig Club was founded in the summer of 1941 and initially had 39 members from among the patients McIndoe had treated since the air battles of 1940, as well as the hospital staff. There were eventually 649 members and they produced a magazine called Guinea Pig which appeared until 2003. McIndoe died in 1960 at the age of 59, and is the only civilian interred in the RAF church of St Clement Danes on the Strand in London.

ABOVE: Rescue workers pull a victim from the rubble trapped in a bomb-damaged building following heavy air raids on London during the Blitz.



BELOW: St Paul's Cathedral rises above the ruins that have surrounded it during five years of war. An elaborate plan was drawn up for the rebuilding of the City of London but reconstruction lasted for years, partly because of legal arguments over ownership of the ruins.

long periods of schooling at the height of the bombing emergency.

The economic and military damage caused by the bombing was a good deal lighter than the German side had hoped. Aircraft production was held up for a few weeks after attacks on the Supermarine factories at Southampton and the Spitfire factory at Castle Bromwich in Birmingham. But the assault on British stores of food and other materials in the major ports did not prove too disruptive. In five months of bombing a total of around 70,000 tons of food stocks were destroyed but only 0.5 per cent of Britain's stored oil reserves were lost. Interruption to utilities and services could be restored quickly and the overall impact on the productivity of the British war economy was small in relation to the cost to the Germans of their assault.

The battle did have the effect of galvanizing the British public in ways which defeat in France or Norway had not. Some 600,000 volunteers worked in the civil defence forces in addition to the tens of thousands who worked in other volunteer capacities for the home front. The period of the Battle of Britain and the Blitz was the point at which most British people came to understand the dimensions of total war fought not only between armed forces but against the civilian population as well. German hopes that British morale on the home front might crack in 1940 proved misplaced, but the cost in suffering, loss and dislocation caused was real enough.

CASUALTIES

Aircraft losses July–October 1940

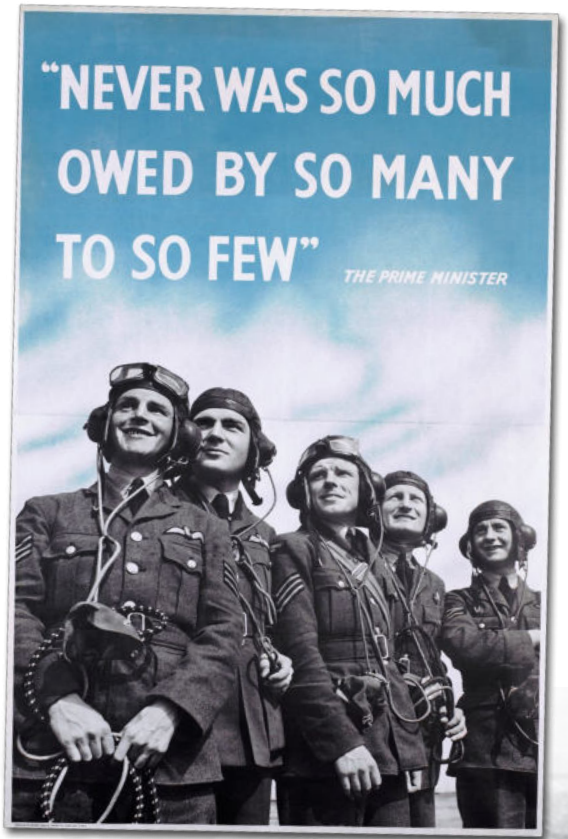
German air force	1,887
RAF Fighter Command	1,023
RAF Bomber Command	376
RAF Coastal Command	148

Aircrew losses July–October 1940

German air force	2,698
RAF Fighter Command	544

(5 Belgians, 7 Czechs, 29 Poles, 3 Canadians, 3 New Zealanders, 2 Americans)

RIGHT: One of the most famous British posters of the war illustrates the heroic status enjoyed by Britain's fighter pilots after the Battle of Britain. Pilots joked that Churchill's phrase referred to their mess bills.


"NEVER WAS SO MUCH OWED BY SO MANY TO SO FEW"
THE PRIME MINISTER

BELOW: A scrapyard of German aircraft from the air battles over England. The materials were recycled to help with war production while German equipment was carefully examined to see what lessons the British could learn.

REMEMBERING THE BATTLE

Memory of the Battle of Britain was soon given official status when the Air Ministry produced a small 32-page booklet on the battle in March 1941. The Ministry sold over one million copies in Britain, and more in America and the Empire. The dates for the battle were set as 8 August to 31 October, but by the time the official histories were written the dates generally accepted were 10 July to 31 October, to incorporate the early raids and air battles. The major operations on 15 September were chosen to mark Battle of Britain Day and the first celebration took place in 1945, shortly after the end of the war with Japan, with a fly-past in London and a special memorial service in Westminster Abbey.

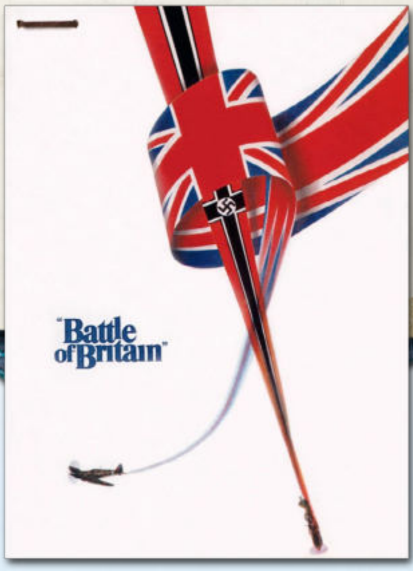
The abbey was also the home of the Battle of Britain Chapel, dedicated on 10 July 1947 to indicate clearly the day the battle was now thought to have begun. Its centrepiece was a stained glass window and a roll of honour was also presented with 1,495 names of pilots and aircrew from Fighter, Bomber and Coastal Command, and the Fleet Air Arm. The chapel became the site for an annual Battle of Britain service. In the 1950s, the Air Ministry searched for other ways of commemorating the battle and in 1957 a Battle of Britain Historic Flight was set up, including three Spitfires and a Hurricane. It was renamed the Battle of Britain Memorial Flight in 1969 and its aircraft appeared regularly at air shows around the country. To mark the sixtieth anniversary of the battle in 2000, the Imperial War Museum annual air show at Duxford (the former Fighter Command station) brought together all the remaining UK-based Spitfires still capable of flying for a final historic fly-past.

The veterans of the battle also began to meet regularly and in 1958 a formal organization, the Battle of Britain Fighter Association, was formed, whose first president was Hugh Dowding. On his death in 1970, he was succeeded by Keith Park. For a long time, there was no statue of Dowding to celebrate his leadership during the battle, but in October 1988 one was finally unveiled by Queen Elizabeth, the Queen Mother, patron of the Fighter Association, outside the RAF church of St Clement Danes on London's Strand. Other memorials have followed. At Capel-le-Ferne in Kent stands the Battle of Britain National Memorial, opened in July 1993. Another Battle of Britain memorial was erected near Croydon airport in 1991, site of many attacks during the battle itself. In 2005, a major monument was set up on the Victoria Embankment in central London.

The many Fighter Command stations from which the battle was fought have fared unevenly in the post-war years. Biggin Hill and Kenley retained a few buildings from the war period, but the best preserved air station was at Duxford, which became home to the Imperial War Museum's aircraft collection. The Uxbridge control centre for 11 Group has also been preserved

BATTLE OF BRITAIN

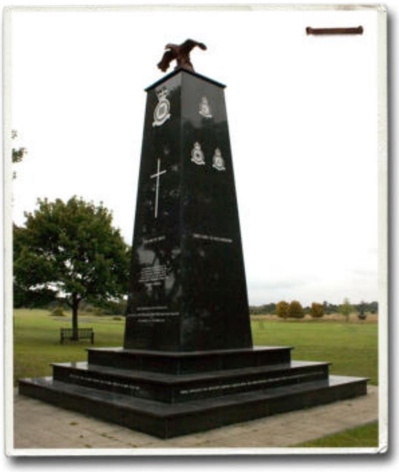
In 1969, one of the most famous of all British war films was released, Battle of Britain. Produced by Harry Saltzman and S. Benjamin Fisz, the film's cast was a roll call of famous British actors and actresses, including Laurence Olivier as Hugh Dowding and Trevor Howard as Keith Park. Unusually, the German parts were played by native Germans and their conversation subtitled. Over 100 aircraft were used in making the film, including a dozen airworthy Spitfires and three Hurricanes still capable of flying. The German aircraft were represented by Spanish versions of the Heinkel He111 bombers and Messerschmitt Me109 fighters which had served in the Spanish air force. They were powered by British Merlin engines. Filming took place at four surviving Fighter Command stations, including Duxford, where a hangar was blown up for the film. Poor weather hampered production and shots of clear blue skies were filmed in Spain.



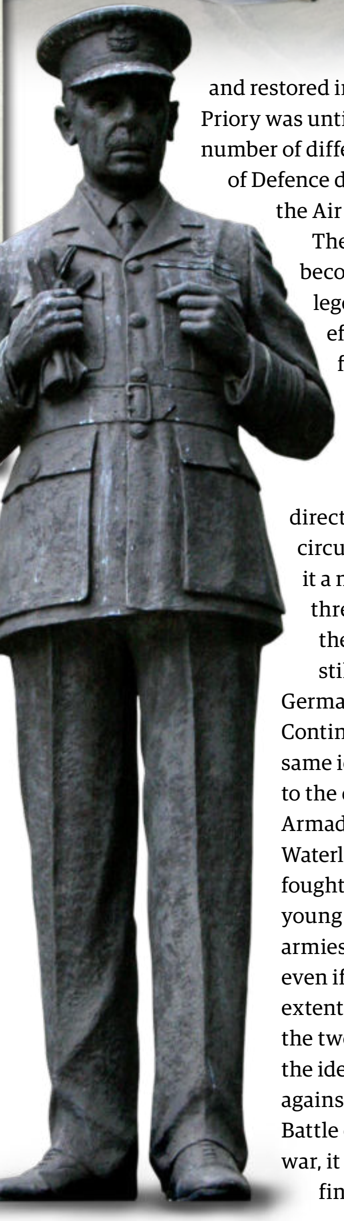
BELOW: The Battle of Britain Memorial Day ceremony at Capel-le-Ferne in Kent in July 2009. Veterans of the battle lay wreaths at the statue of a fighter pilot, which dominates the memorial itself.

THE ROYAL AIR
ROYAL AIR FORCES
EN MOTHER 9 JULY 1993

ABOVE: Douglas Bader (left), Arthur Clouston (centre), and Keith Park (right) at a ceremony in February 1948 to name a locomotive "Fighter Pilot".



ABOVE: To the south of Croydon airport on the Purley Way stands a Battle of Britain monument erected in 1991. The 23 foot obelisk is topped by a bronze eagle and bears on it the names of those who died in the battle.



and restored in its entirety. Bentley Priory was until recently still home to a number of different RAF and Ministry of Defence departments, including the Air Historical Branch.

The Battle of Britain has become one of the central legends of Britain's war effort. It has benefited from the persistent image of an English David taking on a German Goliath. Its enduring quality stems directly from the historical circumstances which made it a necessary victory. The threat of invasion against the only country in Europe still fighting against German domination of the Continent gave the battle the same iconic status accorded to the defeat of the Spanish Armada or the victory at Waterloo. The battle was also fought and won by a handful of young men rather than whole armies. The image of the "few", even if it exaggerates the extent of the disparity between the two sides, resonates with the idea of lonely defiance against tyranny. Though the Battle of Britain did not win the war, it kept alive the prospect of final victory.

ABOVE: The Battle of Britain Memorial Flight, first set up in the Fifties, now consists of a Spitfire and Hurricane fighter and an Avro Lancaster bomber. The flight is used for formal fly-pasts and as a spectacle at the air shows where the battle is still commemorated.

LEFT: In 1988 a statue to Dowding was erected outside St. Clement Danes Church on the Strand in central London. Dowding's ashes were buried in 1970 in Westminster Abbey under the Battle of Britain memorial window.

THE BATTLE OF BRITAIN MONUMENT, LONDON

The Battle of Britain Monument stands on London's Victoria Embankment not far from the Houses of Parliament. It was formally opened in September 2005 in front of 70 pilot veterans from the battle and was the result of collaboration between the Battle of Britain Historical Society and Westminster Council. The monument site granted by the Council was a 25-metre (82-foot) granite structure which had originally been built as a smoke outlet for steam-powered underground trains. A walkway was cut through the structure, and bronze panels depicting the battle and Britain at war in 1940 attached on either side. A full list of those who fought in the battle is included, organized by nationality. The monument was sculpted by Paul Day.

CREDITS

The publisher would like to thank the following for their help with the production of this book:

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Squadron Leader Stuart Balfour,
Royal Air Force
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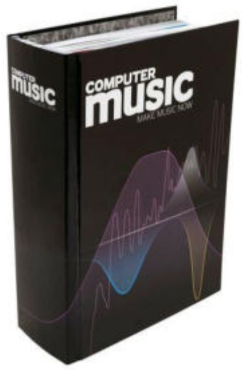
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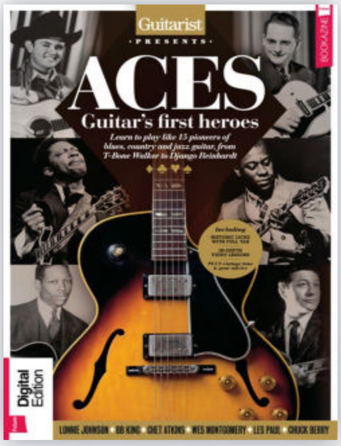
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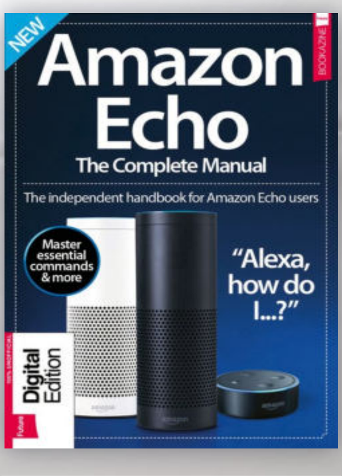
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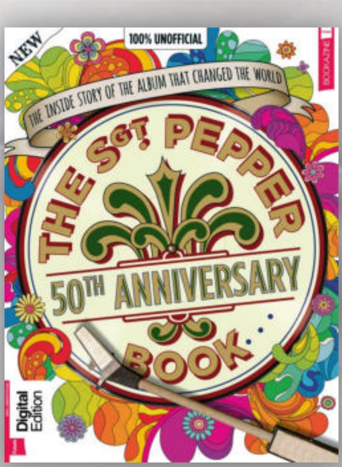
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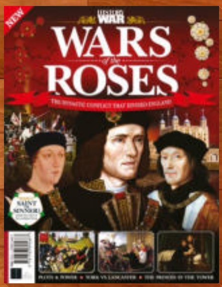
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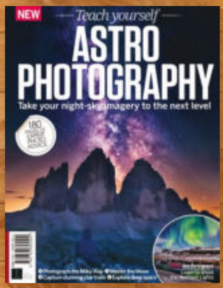
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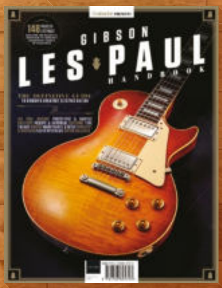
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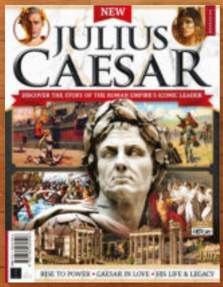
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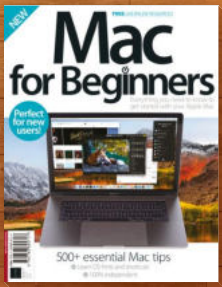
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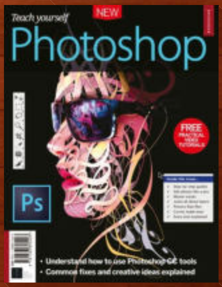
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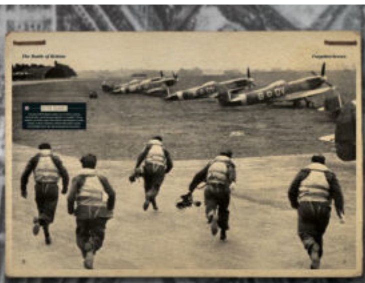

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